

SAMSUNG

ELECTRONIC CASH REGISTER

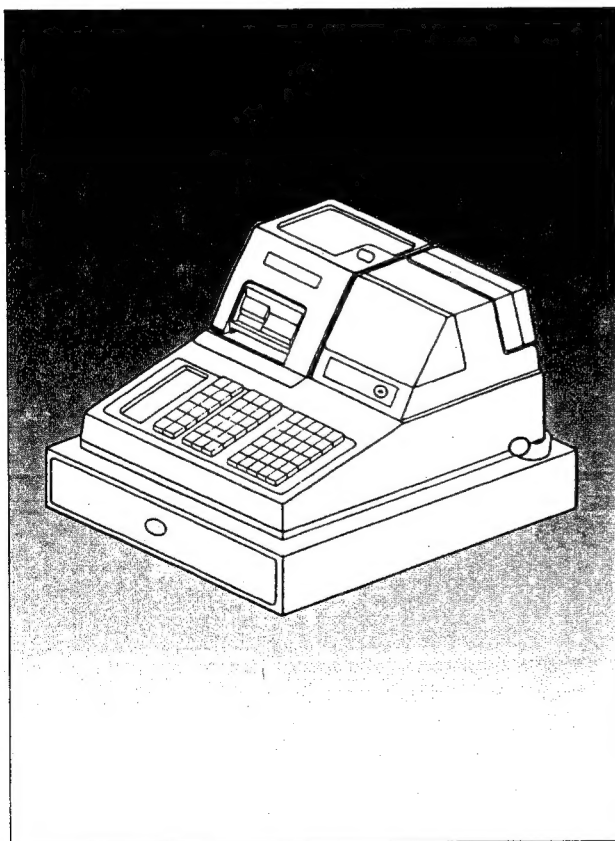
ER-4615R

ER-4615 series

ER-4915 series

SERVICE Manual

ELECTRONIC CASH REGISTER



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SYSTEM OVERVIEW

This ELECTRONIC CASH REGISTER is a microprocessor based system, using an 8-bit single chip microprocessor. This service manual provides technical information for many individual component systems, circuits and gives an analysis of the operations performed by the circuits. If you need more technical information, please call our service branch. Schematics and specifications provide needed information for the accurate troubleshooting.

All information in this manual is subject to change without prior notice. Therefore, you must check the correspondence of your manual with your machine. No part of this manual may be copied or reproduced in any form or by any means, without the prior written consent of Samsung Electronics Co., Ltd. .

| AREA | MODEL | KEYBOARD | PRINTER | SRAM | POWER TRANS |
|--------|----------|------------|----------|-------|-------------|
| EUROPE | ER-4615R | MAX 60 Key | ERP-300V | 62256 | 230V 50Hz |
| | ER-4615 | 60 | | 62256 | |
| | ER-4640 | 90 | | 62256 | |
| | ER-4800 | 160 | | 62256 | |
| U.S.A | ER-4915 | 60 | ERP-300V | 62256 | 120V 60Hz |
| | ER-4940 | 90 | | 62256 | |
| | ER-4900 | 160 | | 62256 | |

Note:

Prior to using this Electronic Cash Register (ECR) for the first time, leave it powered on in the "REG" mode for at least twenty-four hours. This allows the Ni-Cad battery, which maintains the memory of the ECR while the power is off, to charge completely.

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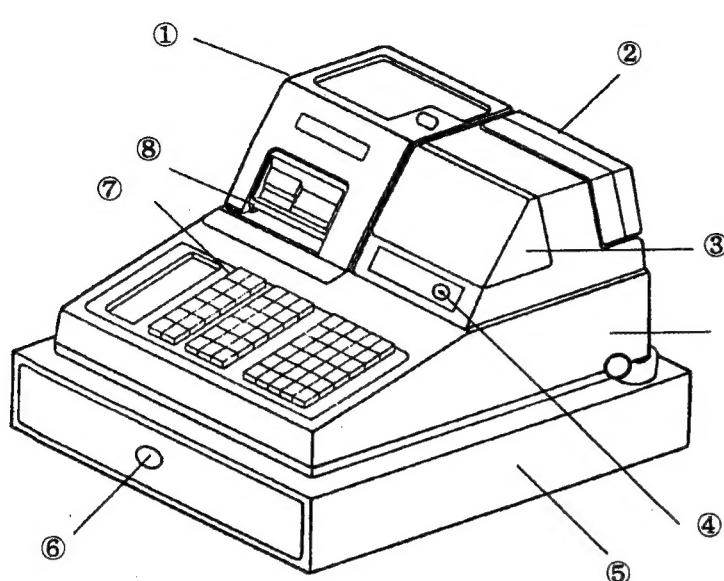
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1. Product Specifications

| ITEM | DESCRIPTION | REMARK |
|-------------------|---|-----------------|
| POWER SOURCE | 120V AC $\pm 10\%$ 60Hz 230V AC $\pm 10\%$ 50Hz | |
| POWER Consumption | 34watts (MAX) | |
| Printer | ERP-300V 9- Pin dot matrix printing speed : 3.0 lines/sec | |
| PROCESSOR | INTEL 8032 / 8052 | |
| MEMORY | SRAM : KM62256 EPROM (27C512) | Battery back-up |
| BATTERY | Ni-Cad,60mA, Charge time : 24hours Lithium,3V,950mAH | ER-4615R |
| DRAWER | 4B/8C,5B/5C wait : 9.0 kg Dimension : 460(W) x 60(L)x110(H) | |
| DIMENSION | 450(L) X 400(W) X 309(H)mm | |
| WEIGHT | 18.3Kg | |
| DISPLAY | FRONT : 10 DIGITS REAR : 9 DIGITS | |
| KEY-BOARD | 60 KEY (MEMBRANE TYPE) 15 KEY : DEPARTMENT KEY | |

2. Features, Dimensions, Installation and Operation Instructions

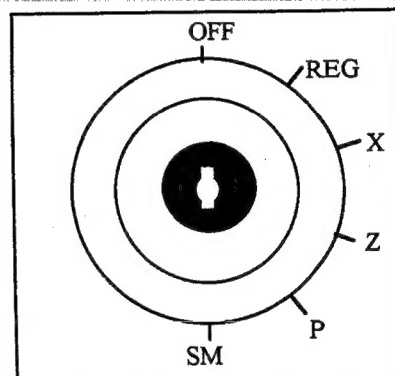
2-1 Features



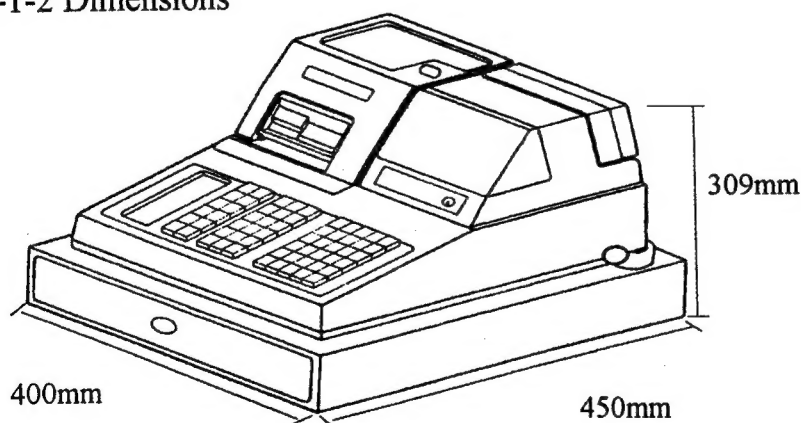
- ① COVER PRINTER
- ② TURRET DISPLAY
- ③ WINDOW DISPLAY
- ④ MODE SWITCH
- ⑤ DRAWER
- ⑥ DRAWER LOCK KEY
- ⑦ KEYBOARD
- ⑧ IMPACT DOT PRINTER

2-1-1 Mode Switch

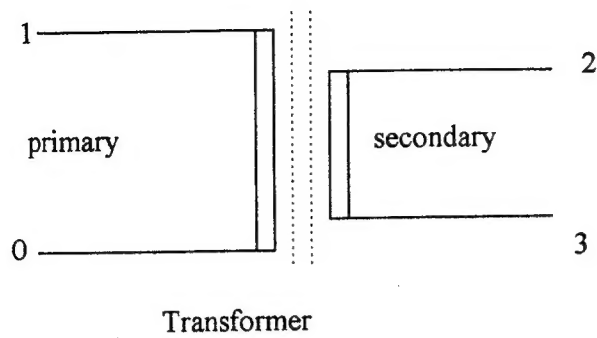
| MODE | FUNCTION |
|------|-----------------|
| OFF | Operation stop |
| REG | Sales Operation |
| X | X level reports |
| Z | Z level reports |
| P | Program mode |
| SM | Service mode |



2-1-2 Dimensions



2-2 Comparison Chart



| AREA | PRIMARY | SECONDARY |
|--------|-----------|---------------|
| EUROPE | 230V 50Hz | 2-3 22.5V(AC) |
| USA | 120V 60Hz | 2-3 22.5V(AC) |

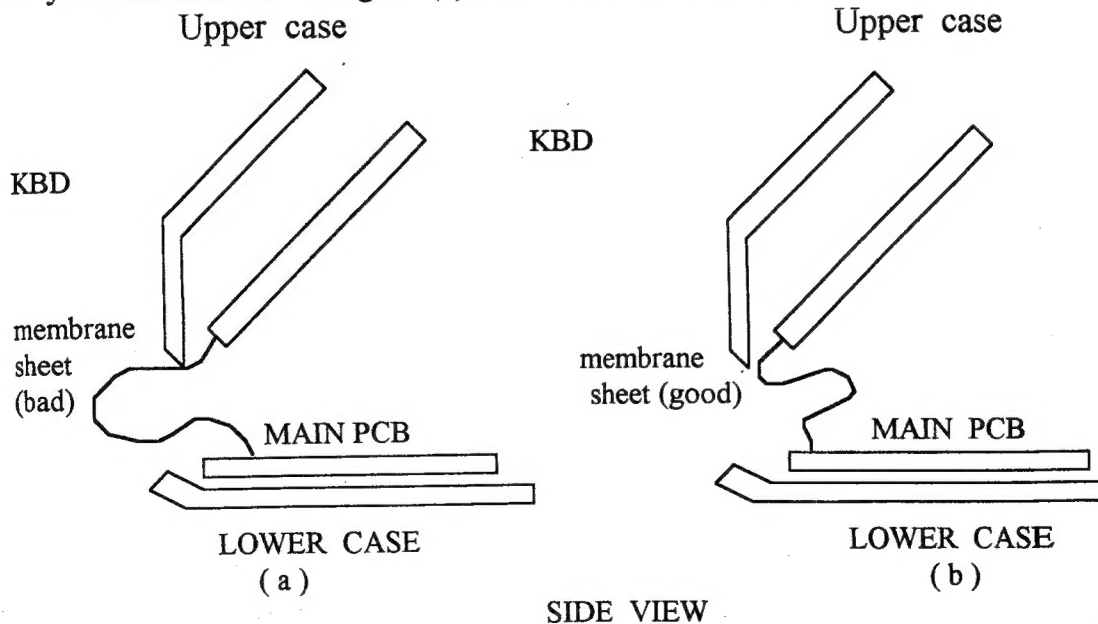
| AREA LO. NO. | EUROPE | | U. S. A. | |
|-----------------|-------------|--------------|----------|----------------|
| | S P E C | CODE NO. | S P E C | CODE NO. |
| F U S E | T3.15L 250V | 949 115010TH | T3A,125V | 949-115202SLNA |

2-3.Installation

2-3-1 General warning

When you connect the keyboard to the MAIN PCB , make sure membrane sheet is the shape as shown in figure (b) .

If you assemble as in figure (a), the keyboard may malfunction.



2-3-2 Drawer setup

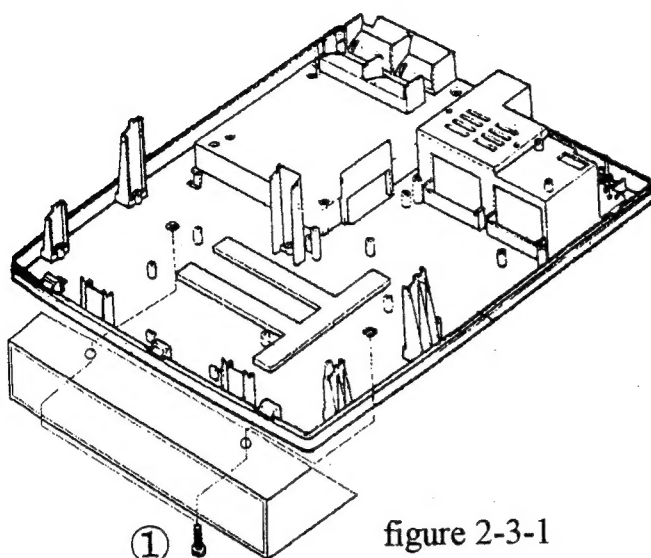


figure 2-3-1

To install the drawer in the lower case, fix the ① screws, as you see in the figure, together with the drawer and lower case. Refer to the exploded diagram for the disassembly details for other parts of ECR.

2-3-3 Ribbon cassette setup

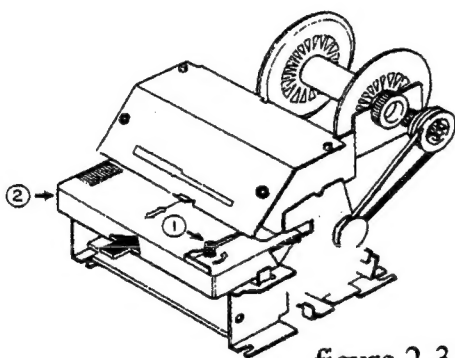


figure 2-3-2

- (1) Before inserting the ribbon cassette, turn the knob(①) counter clockwise in order to prevent twisting ribbon.
- (2) After inserting the ribbon cassette, turn the knob(①) counter clockwise in order to prevent twisting ribbon.

2-3-4 Insertion of Receipt / Journal paper

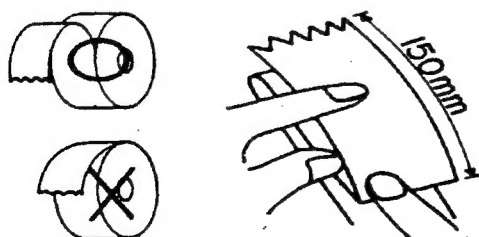


figure 2-3-3

Ⓐ Under the condition of marked ○ paper, unroll the paper about 150 mm, then fold the paper like figure 2-3-3

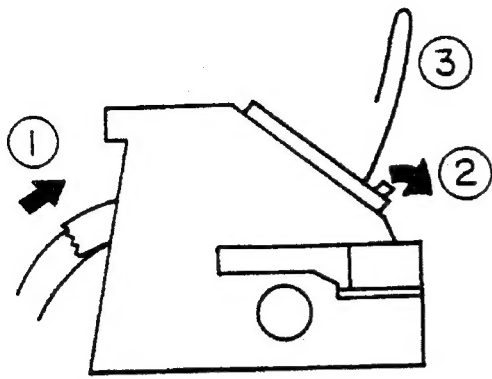


figure 2-3-4

- ⑧ Insert the folded paper in the back ① of ERP-300V. While holding the lever ② down, pull the paper out until the fold point ③ is completely out of the machine.

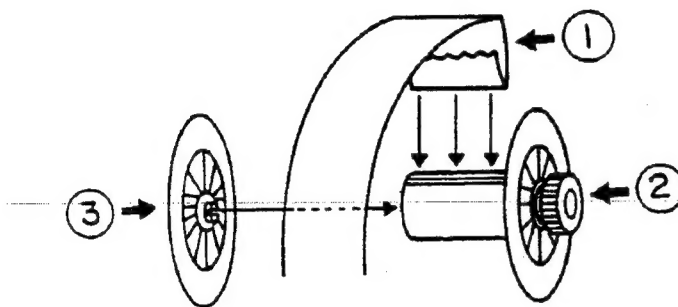


figure 2-3-5

- ③ Cut the receipt side paper.

- ④ Insert the journal side paper in the slit of the rewind spindle. Wind spindle 3 or 4 times.

Push disk ③ onto the spindle as shown in figure 2-3-5

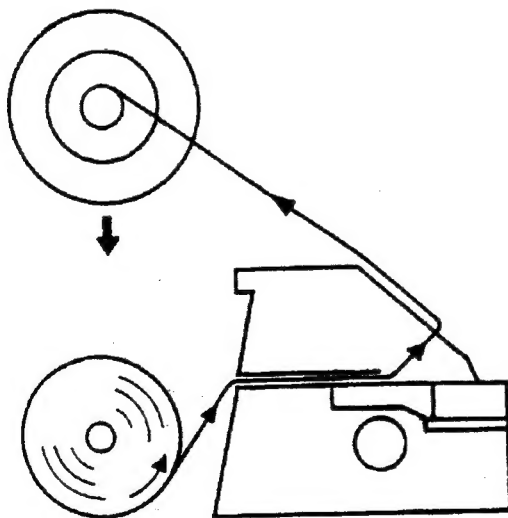


figure 2-3-6

- ⑤ When the journal side paper is loose, rewind the spindle to make the paper tight.

2-4. Operating Instruction

2-4-1 Initial Clear

The Initial clear procedure may be used for clearing keyboard lock-ups and constant error conditions. This procedure will finish the current transaction / operation and clear temporary memory buffers. An initial clear procedure will not effect register programming , or erase previously stored totals in RAM memory.

Caution: 1) An initial clear will cause balancing discrepancies if it is performed in the middle of a transaction.
2) If you 'Power ON' while the display connector on the PCB is open, it may harm the system, especially the CPU.

Turn the keylock to the " P " position on the mode key plate and press the "SUBTOTAL "Key. While holding the "SUBTOTAL" key down, power 'ECR' off and power it back on. Then, the following receipt will print.

RAM ALL CLEAR OK !

CLERK 0 NO. 000001
TIME 10:19 0000
DATE 06.10.'94

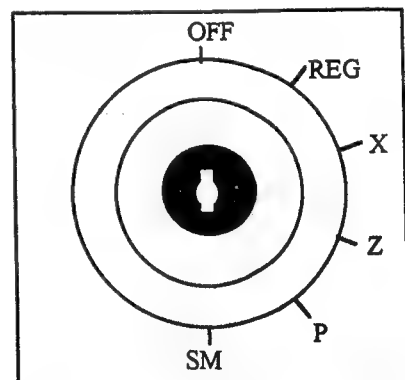
2-4-2 Clearing Totals From Memory

The memory of register must be RAM Cleared before initial programming take place. Having the "C" key in the SM-Mode position allows for memory clearing.

- See the diagram to locate the SM-Mode position.

2-4-3 Total Memory RAM Clear (00 Key)

Clearing the RAM on the cash register erases all totals and installs the default program. This procedure must take place before programming the cash register.



SM-mode keylock position

2-4-4. Clear all RAM memory

Use this procedure to clear totals from memory.

- 1) Unplug ECR.
- 2) Insert the key (marked 'C') into the control lock and turn clockwise, past the position marked 'P', to the Service mode (SM). This position is not marked on the control lock plate, but the 'C' key can travel to this position.
- 3) While holding the "00" key down, power the register off and back on.
- 4) Switch off the CN21 shunt switch (near keyboard connector CN11) by changing the shunt switch position 'on' to 'off'. After this procedure, "total memory RAM clear " cannot be performed. If you want this procedure after installation, you have to switch CN21 on(only for ER-4615R).
- 5) Continue to hold the key down until the receipt printer stops printing and the display shows 0.00.

KEYS

| | | |
|---|---|--|
| ***** RAM ALL CLEAR OK ! ***** CLERK 0 NO. 000001 TIME 14:08 0000 DATE 12.28.'94 MON | ***** RESET ALL CN/TOTAL ! ***** CLERK 0 NO. 000001 TIME 14:08 0000 DATE 12.28.'94 MON | ***** RESET GRAND TOTAL ! ***** CLERK 0 NO. 000001 TIME 14:08 0000 DATE 12.28.'94 MON |
|---|---|--|

Key : 00
Total memory
RAM Clear

Key : CHECK
Reset All
Total & counters

Key : CASH
Reset Grand Total only

2-4-5 Service Mode Diagnostics

The Samsung register offers several diagnostic routines while in the SM or Service Mode. Each of these tests require the "C" key to be turned to the SM Mode position. See Illustration on page 6.

The available diagnostics are :

Printer / display Test :

Enter 1 and press the CASH TEND Key.
The register will cycle completely through the print character set while testing the display.

Keyboard Test

Enter 2 and press the CASH TEND key. Press each key on the keyboard, one key at a time. Each key shows its location code on the display as you press it.

Exit the keyboard 'test mode' by pressing the "CLEAR" key twice.

Keylock Test :

Enter 3 and press the CASH TEND key.
The corresponding code will appear on the display as the "C" key is rotated from position to position.

```

áááááAáááááíííííñññññ
óóóóóúúúúú !"#%&'()*
+,-./0123456789:;<=>?
@ABCDEFGHIJKLMNPOQRST
UVWXYZRf0Efabdefghi
jklmnopqrstuvwxyz=áá
áááááAáááááíííííñññññ
óóóóóúúúúú !"#%&'()*
+,-./0123456789:;<=>?@A
BCDEFGHIJKLMNPOQRSTU
VWXYZRf0Efabdefghijk
lmnopqrstuvwxyz=áááá
áááááAáááááíííííñññññ
óóóóóúúúúú !"#%&'()*
+,-./0123456789:;<=>?@ABC
DEFGHIJKLMNPOQRSTU
VWXYZRf0Efabdefghijklm
nopqrstuvwxyz=áááááA
áááááAáááááíííííñññññ
óóóóóúúúúú !"#%&'()*
+,-./0123456789:;<=>?@ABCDE
FGHIJKLMNPOQRSTU
VWXYZRf0Efabdefghijklmno
pqrstuvwxyz=áááááAá
áááááíííííñññññóóóóó
úúúúú !"#%&'()*
+,-./0123456789:;<=>?@ABCDEF
GHIJKLMNPOQRSTU
VWXYZRf0Efabdefghijklmno
pqrstuvwxyz=áááááAááá
áááááíííííñññññ
DATE 01.14.'96 FRI

```

```

CLERK 00 NO.000003
TIME 10:20 0000

```

Printer Test

2-4-6 EPROM Check Sum

Enter 4 and press the CASH TEND key.
The software version and the Check sum
data will print on the receipt.

```
*****  
MODEL      :ER-4615R  
VERSION NO :STAND01  
CHECK SUM  :IF8A  
*****  
CLERK 0    NO. 000004  
TIME 14:11      0000  
DATE 12.28. '94  MON
```

2-4-7 Setting the number of departments

- 1) Insert the "C" key into the control lock (see page 6) and turn clockwise to the SM (service) mode position. This position is not marked on the control lock plate, and only the "C" key will travel to this position.
- 2) Enter the following key sequence


(XX) - [X/TIME] - [CASH/TEND]

XX : ER-4915 (5,10,15)
ER-4940 (15 , 40)
ER-4615 (5,10,0[15])
ER-4615R (5,10,0[15])
ER-4640 (15,0[40])

Refer to the Other departments programming,
see the 'user manual'.

Now , the Samsung ECR is ready to operate using the default program.
The balance of programming procedures take place with the 'control lock'
in the 'P' position.

3. Troubleshooting

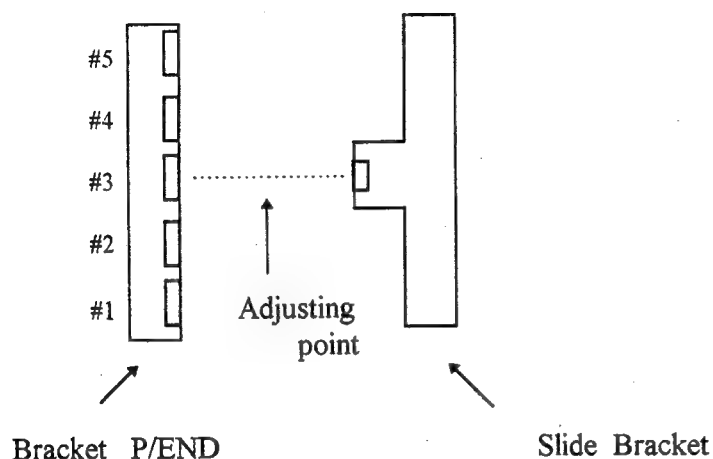
- 1) "P.P. " on the display during POWER ON.
 - Check for disconnection of connector between MAIN PCB side and 'PRINTER side' (CN7CN8CN13).
 - Check the Printer Ribbon and Paper Jam.
- 2) Buzzer Sound during POWER ON.
 - Check whether the display connector is connected or not.
 - Check whether the turret connector is connected or not.
- 3) "  " on the display .
 - Press the " CLEAR" key to clear this condition.

Refer to other message , see the user manual .

4 Alignments and Adjustments

4 -1 Adjusting of Roll paper Near-end Detector (Type 1 paper sensor)

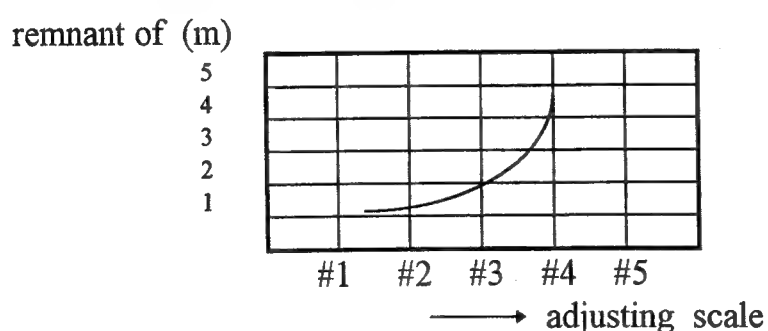
1) Adjusting Point



(PAPER T= 0.075 mm)

As you see in the figure above, the slide bracket is fixed at adjusting scale #3 for the roll paper recommended by Samsung.

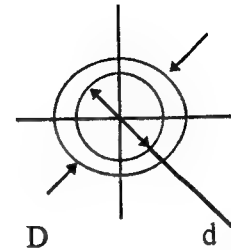
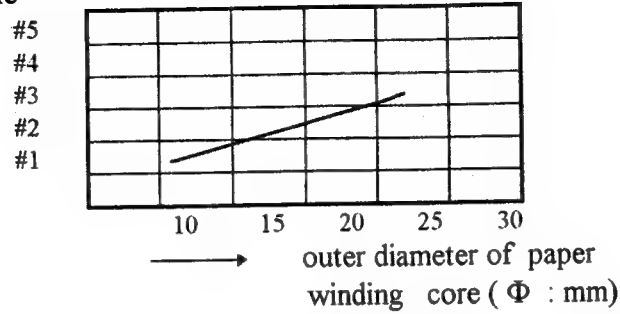
2) The relationship between adjusting scale and the remnant of Roll paper :
When using Samsung recommended roll paper (paper thickness = 0.075mm, paper width = 44.5 ± 0.5 mm), the relationship between adjusting scale and remnant of roll paper is as follows.



When using paper other than Samsung recommended paper (thickness: approx. 0.075mm), ignore the figure above.

3) The relationship between adjusting scale and ROLL paper winding core :

adjusting scale



D : out diameter
d : Inner diameter

(note)

- When employing roll paper other than Samsung recommended paper, the length of remnant of roll paper will be differ.
- When using roll paper with a red end mark at the end of it, winding core may be pulled out of its holder due to the paper sticking to the winding core. The paper sensor may malfunction if the winding core is pulled out of its holder.

4-2. ERP-300V Printer Adjustment

4-2-1. Procedure of disassembly

- 1) Remove the four screws [a] on the upper frame ass'y © and disassemble cover A (see figure 4-2-1).
- 2) Remove the screws [b] (two) and disassemble the Ribbon Frame B from the Lower Frame Ass'y ① as figure 4-2-1.

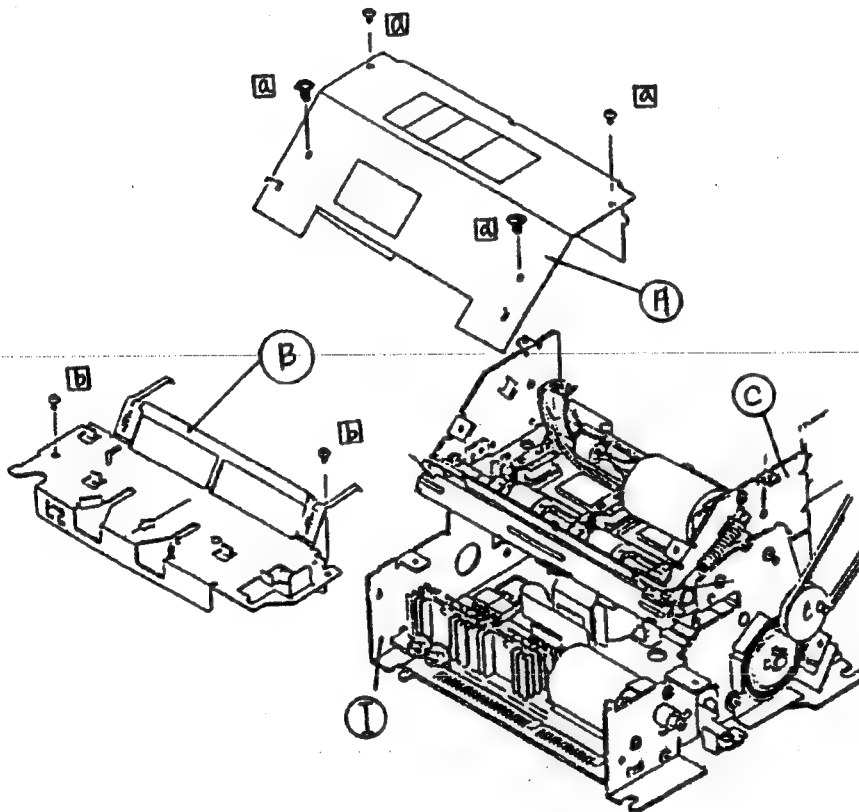



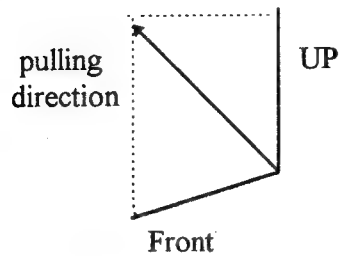





Figure 4-2-1 Printer Disassembly

- 3) Remove the four screws  and disassemble the Upper frame ass'y  from the Lower frame ass'y .

4)



When you disassemble the Upper frame ass'y  from the Lower Frame Ass'y , pull the  Ass'y up away from the Lower Frame Ass'y like the direction of the diagram .

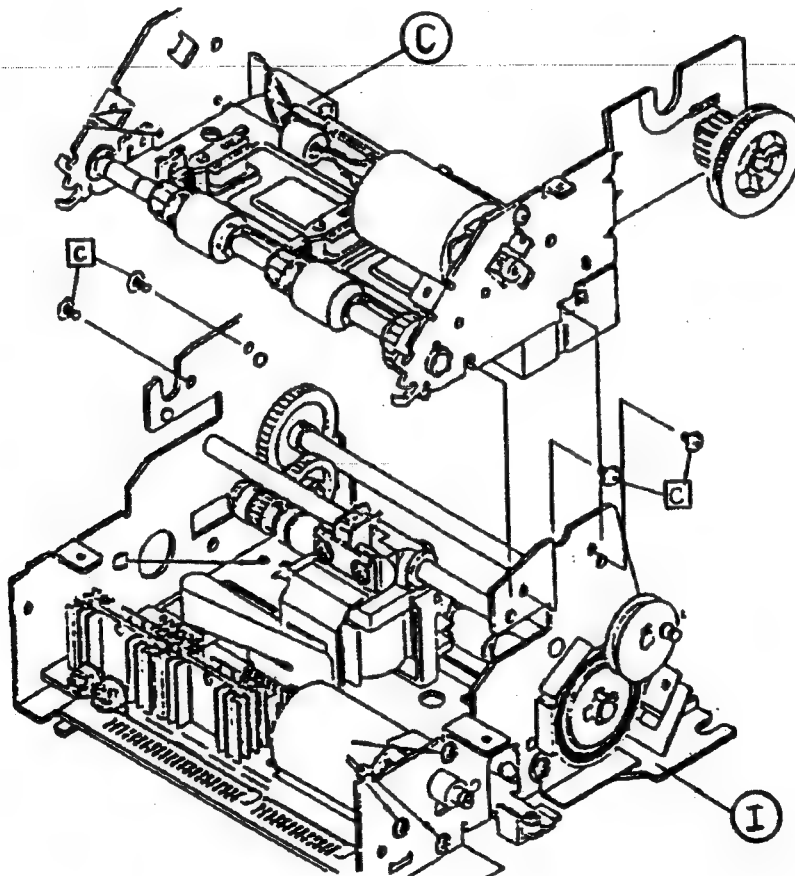


Figure 4-2-2 Separating the Upper + Lower Frame Ass'y

- 5) Turn the upper Frame Ass'y ③ upside down and remove the three screws ④. Disassemble the Stamp Paper Guide Ass'y ⑤ from the Upper frame ass'y ③.

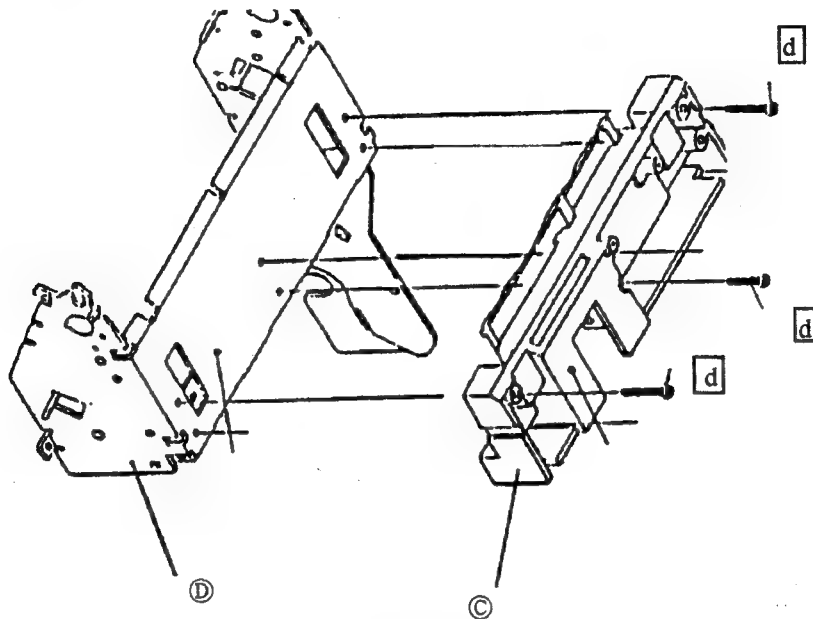


Figure 4-2-3 Stamp Paper Guide Removal

- 6) Remove the Platen Paper Guide ⑥'s left side screw ⑦ which ties the platen paper guide Ass'y ⑥ to the Stamp paper guide ass'y ⑤.

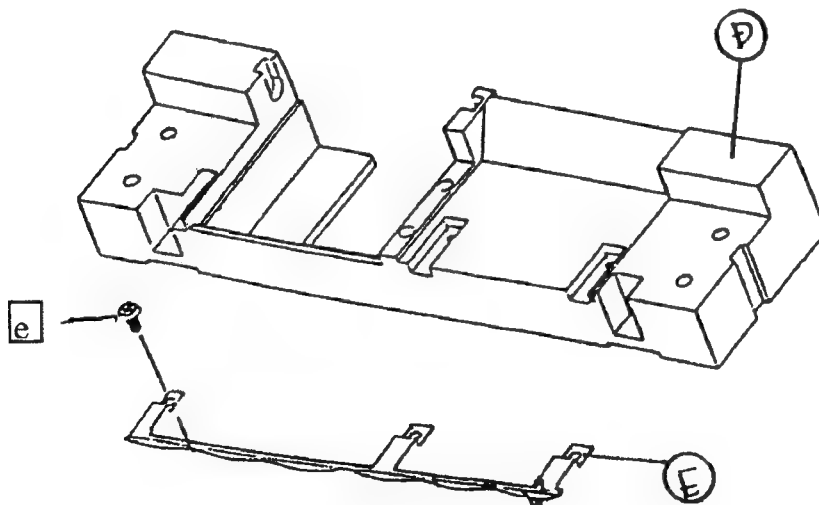


Figure 4-2-4 Platen Paper Guide Removal

4-2-2 Printer Assembly

1) When you assemble the printer, do the reverse sequence of the disassembly procedure.

- Caution : ① When you adjust Head Gap, see and follow the head head gap adjusting method (next page).

: ② When you adjust upper frame Ass'y ㉔, locate STAMP PUSHER(F) on hatched area as you see in the assembly diagram.

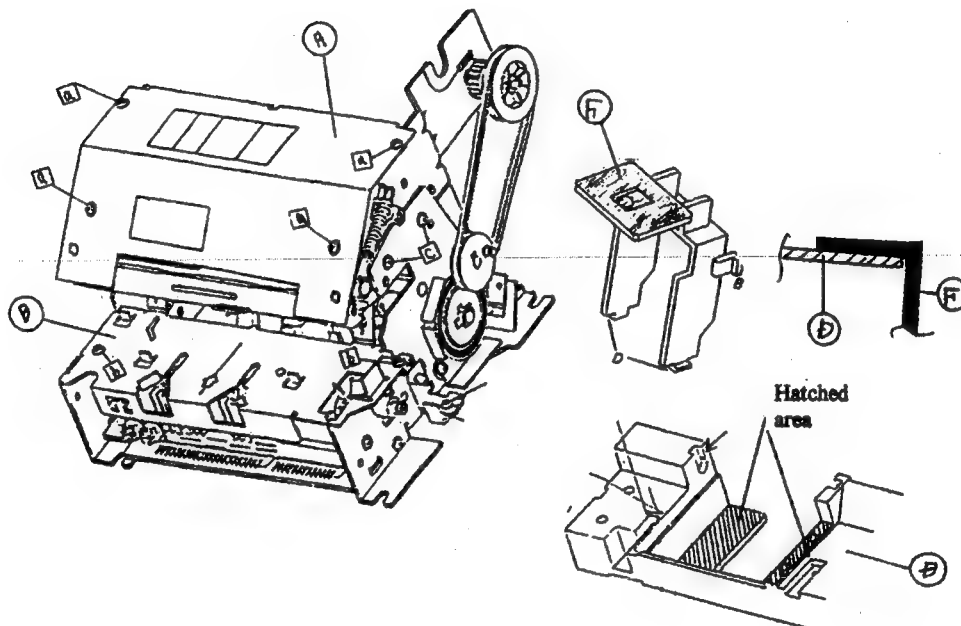


Figure 4-2-5 Printer Assembly Diagram

4-2-3 Head Gap Adjusting Method

- PROCEDURE

- 1) Assemble the Upper Frame Ass'y ④ to the Lower Frame Ass'y ① by reverse sequence of disassembly procedure. Loosely fix the screws.
- 2) Wind Head Gear counter clockwise, move the Head to the right end of platen guide. Insert Gap Gauge (width 0.5mm) between Head and platen. Assemble the two screws ③ tightly.
- 3) In the same method, wind Gear and move the Head to the left end of platen guide. Insert GAP GAUGE (0.5mm) and assemble the two screws ③ (left side).
- 4) When the ③ screws are in place, Nej-Lock (kind of bond) on the position of the four screws ③.

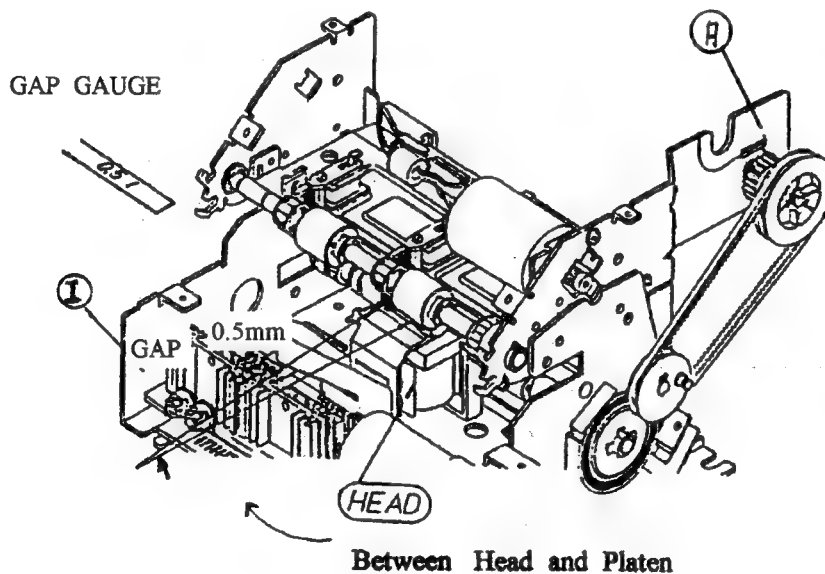


Figure 4-2-6 Head Gap Adjustment

5. Circuitry

5-1 Power Circuit

This ECR has two different power sources, a power circuit and a Battery circuit. The power circuit supplies three different DC voltage sources, +5V for the LOGIC, +24V for driving the Printer and the Display circuit, and +28V for the printer head driving. The BATTERY applies +3.6V to the back-up circuitry.

1) Printer and Display driving Voltage

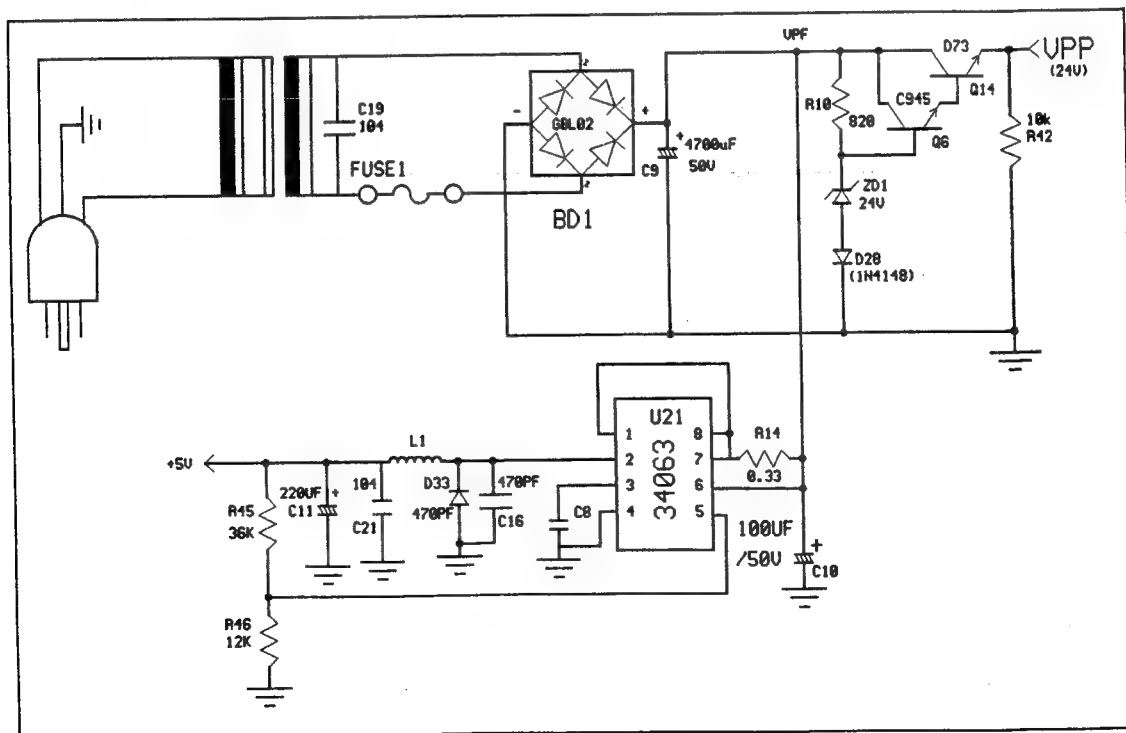
The $V_{PP}(24V)$ voltage is used for the source voltage of the printer driving and display circuit. As shown in the power supply circuit, the secondary AC output voltage of power transformer is converted to DC voltage by the BD1 (bridge diode) and smoothed by a smoothing capacitor C9 (4700uF). This smoothed voltage is supplied for Motor, print-head and display unit. The switching circuit is composed of two transistors Q14, Q6 and two diodes (ZD1, D28).

2) Logic IC Driving Voltage

+5V for Logic IC is supplied from DC converter (U20). The DC converter IC MC34063 generates rectangular waves by connecting +28V to pin6. This output is converted into DC voltage (+5V) by L1, C21 and C11. When the internal switch of U20 (pin2 of U20) is turned on, energy is charged in choke coil L1 and when turned off, coil L1 generates electro-magnetic force. As D33 is a re-circulation diode, it is an e.m.f (electro-magnetic force) path. C11 smoothes the output voltage and R45 and R46 are for voltage feedback.

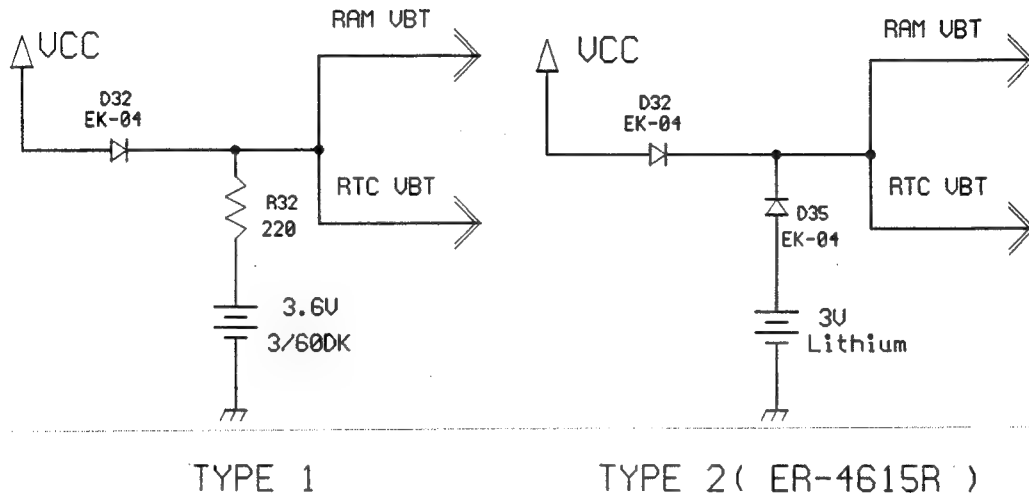
3) $V_{PH}(+28V)$

The $V_{PH}(+28V)$ voltage is used for the driving voltage of the print head solenoid. V_{PH} voltage level may rise or fall when AC input voltage varies.



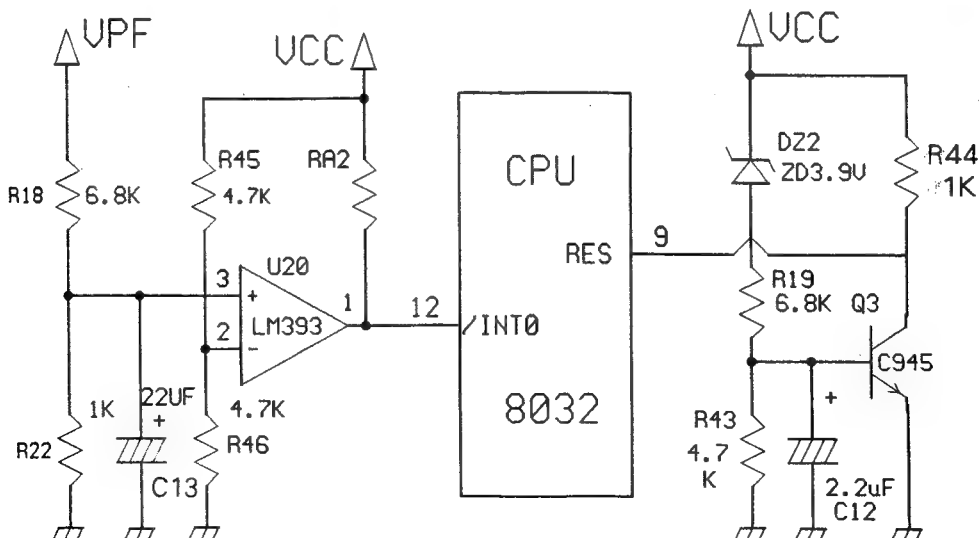
5-2 Battery Circuit

In this register we use two kinds of battery. One is re-charge battery (type 1), other is lithium battery (type 2). In type 1, when the AC power is turned on, the V_{CC} voltage goes to the Battery through D32, R32 for the charge. When the AC power is turned off, the Battery voltage goes to the RAM and RTC (real time clock) IC. In type 2 battery, when the AC power is turned on, battery is not charged. So to speak, the lithium battery is constantly discharged when the input voltage is less than 3V.



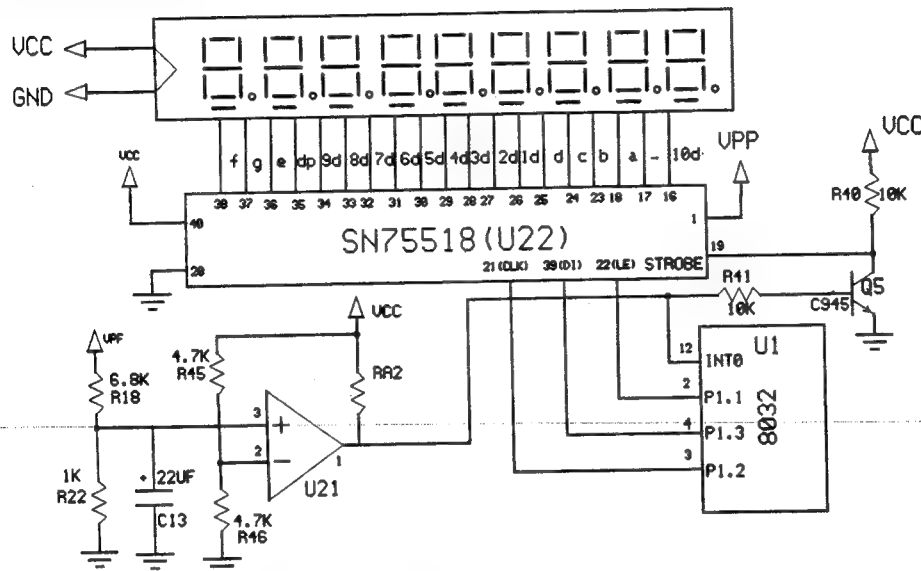
5-3 Reset and power fail circuit

The reset circuit prevents the CPU from starting to operate before the voltage goes to the logic IC operation level and the system is initialized. When the logic voltage of CPU goes down below the normal operating level, such as main power off, this power fail circuit protects / saves the status of the CPU and the RAM data.



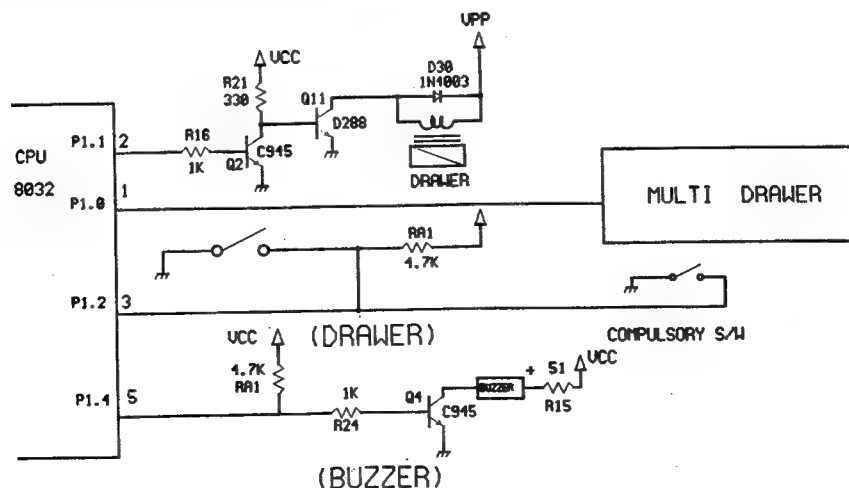
5-4 Dissplay circuit

Display device is activated by U22 IC (SN75518). Display circuit is composed of front display and rear display. The CPU sends the digit and segment signals to U22 (SN75518). The SN75518 is designed to drive a dot matrix or segmented vacuum fluorescent display. This IC consist of a 32 bits shift register, 32 latches, and 32 output 'AND' gates. Serial data is entered into the shift register on the low-to-high transition of CLOCK, while Latch Enable is high, parallel data is transferred to the output buffers through a 32 bit latch. Data present in the latch during the high-to-low transition of Latch Enable are latched. When strobe signal is low, all Q outputs are enabled .



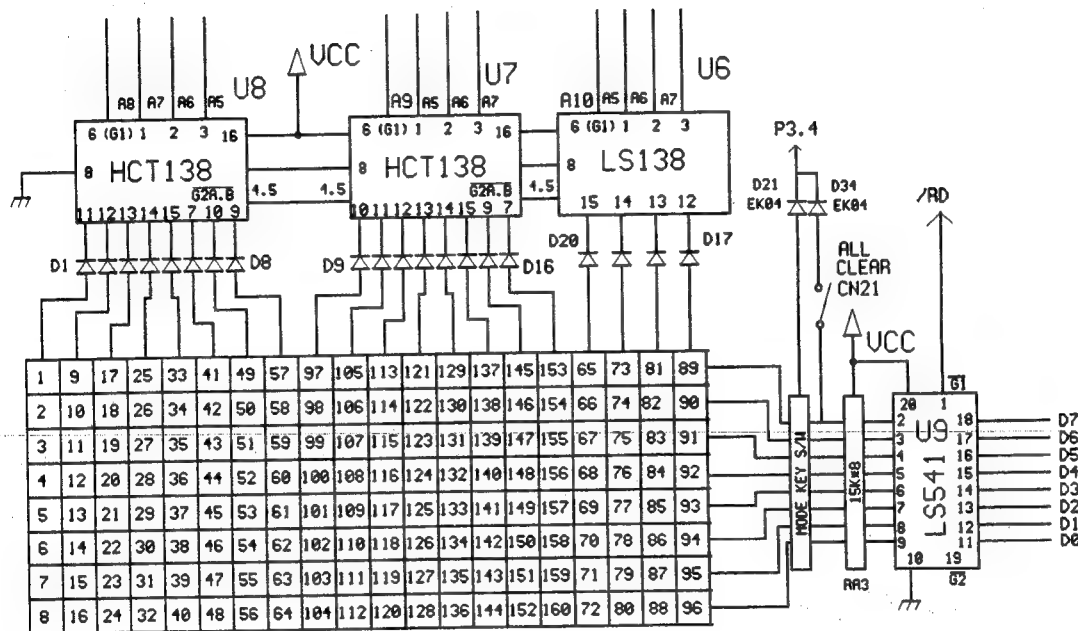
5-5 Drawer and Buzzer circuit

This circuit is used for opening cash drawer and driven by CPU port p1.1, p1.0 (p1.0 is used for multi-drawer). When p1.1 or p1.0's states is low level signal, TR Q2 and Q11 drive the drawer solenoid to open the Cash Drawer. As an optional item, we provide sensor switch (we call it a compulsory switch) which checks the drawer whether it is opened or not. This sensor switch turn on for the drawer open condition, and turn off for the other. The buzzer is activated by the ON/OFF state of CPU Pin 5.



5-6 Keyboard Circuit

The CPU sends scanning data to the decoder IC (74HCT138) sequentially. When the key switch is pressed, the decoded signal goes to the input pin of buffer IC U9(74HCT541), and then CPU reads the returned data from the output pin of the buffer U9 (74HCT541). The CPU (p3.4) sends a mode scan data to the mode switch, and then the CPU reads mode return data from the output pin of the 74HCT541.



| | |
|----|----|
| 41 | 42 |
| 33 | 34 |
| 25 | 26 |
| 17 | 18 |
| 9 | 10 |
| 1 | 2 |

| | | |
|----|----|----|
| 43 | 35 | 27 |
| 44 | 36 | 28 |
| 48 | 40 | 32 |
| 47 | 39 | 31 |
| 46 | 38 | 30 |
| 45 | 37 | 29 |

| | | | | |
|----|----|---|----|----|
| 19 | 11 | 3 | 51 | 59 |
| 20 | 13 | 4 | 52 | 60 |
| 24 | 16 | 8 | 56 | 64 |
| 23 | 15 | 7 | 55 | 63 |
| 22 | 14 | 6 | 54 | 62 |
| 21 | 13 | 5 | 53 | 61 |

60 Key Table

| | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 8 | 96 | 89 | 1 | 2 | 90 | 91 | 3 | 6 | 94 | 92 | 4 | 5 | 13 | 15 |
| 88 | 80 | 73 | 81 | 82 | 74 | 75 | 83 | 86 | 78 | 76 | 20 | 21 | 53 | 55 |
| 24 | 72 | 66 | 17 | 18 | 66 | 67 | 19 | 23 | 70 | 68 | 28 | 29 | 61 | 63 |
| 48 | 64 | 57 | 41 | 42 | 58 | 59 | 43 | 46 | 62 | 60 | 44 | 45 | 77 | 79 |
| 40 | 56 | 49 | 33 | 34 | 50 | 51 | 35 | 38 | 54 | 52 | 36 | 37 | 69 | 71 |
| 32 | 16 | 9 | 25 | 26 | 10 | 11 | 27 | 30 | 14 | 12 | 84 | 85 | 93 | 95 |

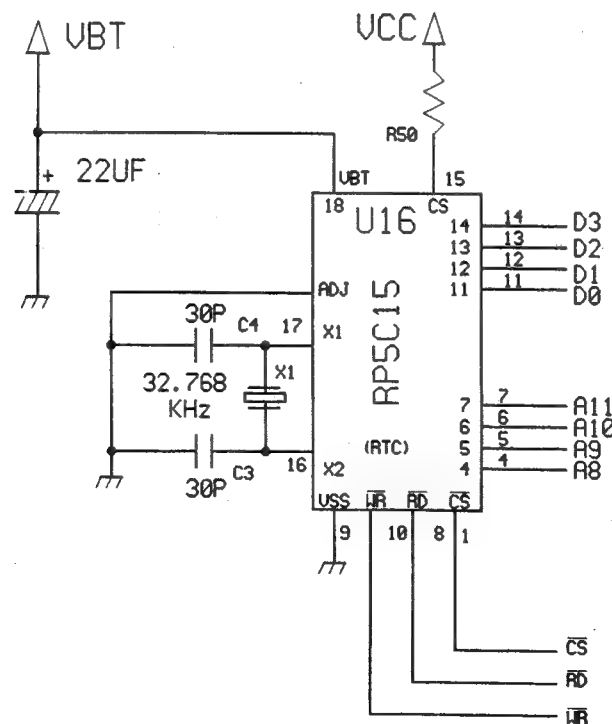
90 Key Table

| | | | | | | | | | | | | | | | |
|----|----|----|----|-----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 8 | 16 | 24 | 32 | 112 | 48 | 88 | 72 | 64 | 56 | 80 | 104 | 128 | 136 | 144 | 152 |
| 7 | 15 | 23 | 31 | 111 | 95 | 87 | 71 | 63 | 55 | 79 | 103 | 27 | 135 | 143 | 151 |
| 6 | 14 | 22 | 40 | 110 | 94 | 86 | 48 | 62 | 54 | 78 | 120 | 126 | 134 | 142 | 160 |
| 5 | 13 | 21 | 39 | 109 | 93 | 85 | 47 | 61 | 53 | 77 | 119 | 125 | 133 | 141 | 159 |
| 1 | 9 | 30 | 38 | 105 | 89 | 70 | 46 | 57 | 49 | 102 | 118 | 121 | 127 | 150 | 158 |
| 2 | 10 | 36 | 37 | 104 | 90 | 69 | 45 | 58 | 50 | 101 | 117 | 122 | 130 | 149 | 157 |
| 4 | 17 | 25 | 33 | 108 | 81 | 65 | 41 | 60 | 73 | 97 | 113 | 124 | 137 | 145 | 153 |
| 3 | 18 | 26 | 34 | 107 | 82 | 66 | 42 | 59 | 74 | 98 | 114 | 123 | 138 | 146 | 154 |
| 12 | 20 | 28 | 36 | 92 | 84 | 68 | 44 | 52 | 76 | 100 | 116 | 132 | 140 | 148 | 156 |
| 11 | 19 | 27 | 35 | 91 | 83 | 67 | 43 | 51 | 75 | 99 | 115 | 131 | 139 | 147 | 155 |

160 Key Table

5-7 Real time clock circuit

The clock circuit is composed of real time clock IC U5 (RP5C15), a crystal and two capacitors. The CPU reads a time data from RP5C15, and writes a new time data to the RP5C15. The address lines respectively mean the contents of the second, minute, hour, etc.



5-8 PRINTER CIRCUIT

This register uses the Samsung ERP-300V Dot Printer. The CPU sends high signal to pin 14 of U13, and then Q9 (C945) is turned on. As a result, the motor in the printer starts to rotate.

The printer generates the timing pulse which determines the position of the character.

The CPU detects the timing pulse, compares the pulse count with the data for printing. If the counted number is included in the data printing area, the CPU sends a high signal to the Latch 74HCT574 during the next pulse.

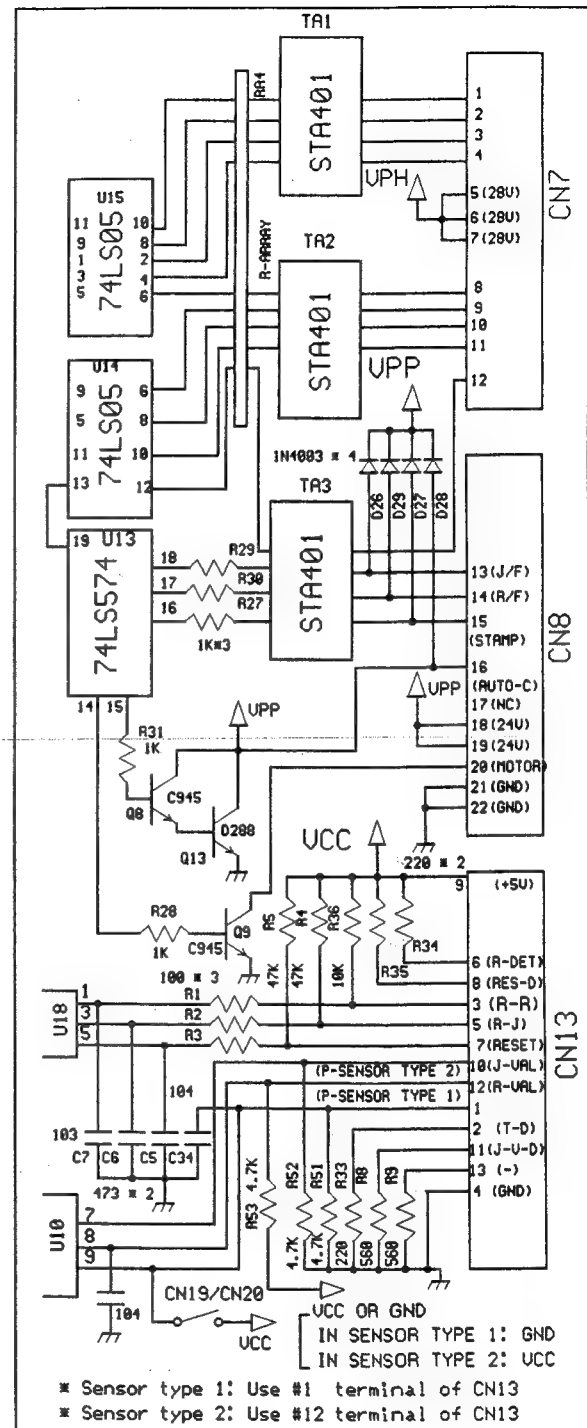
TR array STA401 / STA471, INVERTER IC 74LS05s are used for 9pin-head driving. For receipt Feeding and Journal Feeding 74HCT574 and STA401s are used.

There are two kinds of paper sensor, so to speak, 'type 1' and 'type 2'.

Type 1 paper sensor is installed outside of ERP-300V printer.

Type 2 paper sensor is installed inside of ERP-300V printer.

The detailed paper sensor circuit is continued in next page.



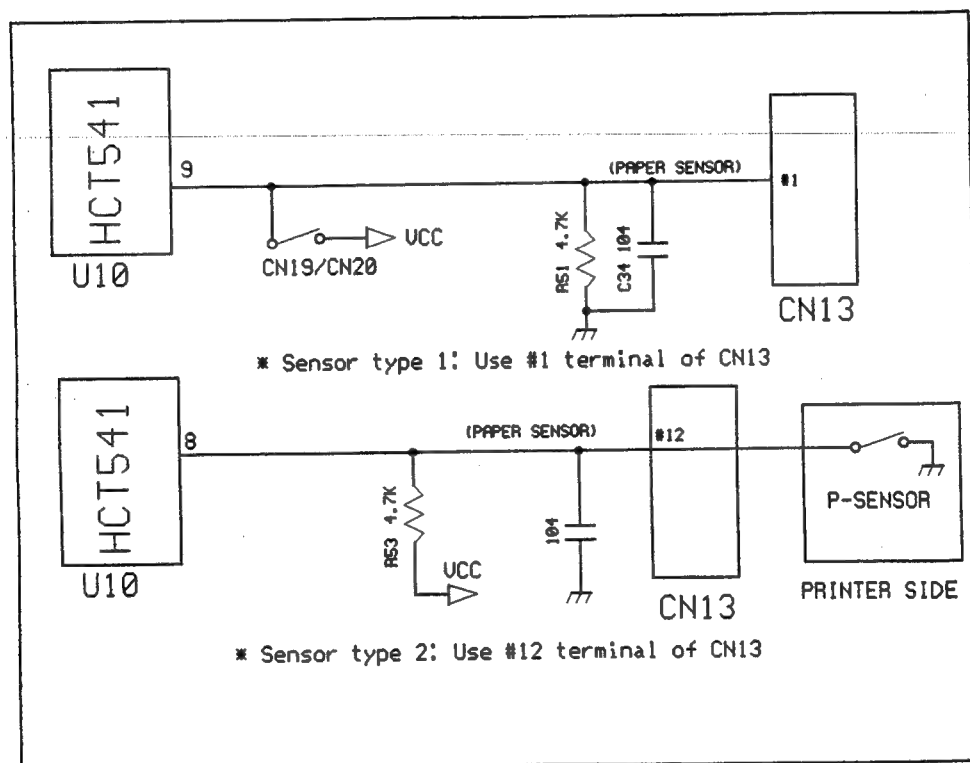
5-9 Paper Sensor Circuit

This ECR uses two kinds of paper sensor, so to speak, type 1 and type2.

Type 1 paper sensor : Installed outside of ERP-300V printer.

Type 2 paper sensor : Installed inside of ERP-300V printer(ER-4615R).

The detailed circuit is as follows.



6 Specification of Major Components

6-1 Printer (ERP-300V)

1) Specifications

1.1 Printing Method : Mechanical serial dot matrix type

1.2 Printing Direction : Bi-directional (Both left and right)

1.3 Printing Speed : 3.0 lines / sec (PCT = 330 to 390m sec, 24V DC, 25)

1.4 Printing format :

1) number of wire : 9

2) Dot Interval

- Horizontal : 0.353mm

- Vertical : 0.350mm

3) Total number of dots

- Receipt side : Max 107 dots / 213 positions

- Journal side : Max 107 dots / 213 positions

- Validation : Max 243 dots / 485 positions

4) Print font

| | |
|---------------------------|---------------------------|
| 9 x 9 (With half dots) | 7 x 9 (With half dots) |
|---------------------------|---------------------------|

5) Printing columns

| | 9x9 (With half dots) | 7x9 (With half dots) |
|--------------|----------------------|----------------------|
| Receipt side | 18 columns | 21 columns |
| Journal side | 18 columns | 21 columns |
| Validation | | 40 columns |

6) Character size (H x V)

| | |
|---------------------|--------------------|
| 1.7 X 3.1 mm (9x9) | 1.3 X 3.1 mm (7x9) |
|---------------------|--------------------|

7) Column interval

| | |
|----------------|---------------|
| 2.12 mm (9x9) | 1.76 mm (7x9) |
|----------------|---------------|

8) Line interval

| | |
|---------------|--------------|
| 5.1 mm (9x9) | 5.1 mm (7x9) |
|---------------|--------------|

1.5 Paper feed

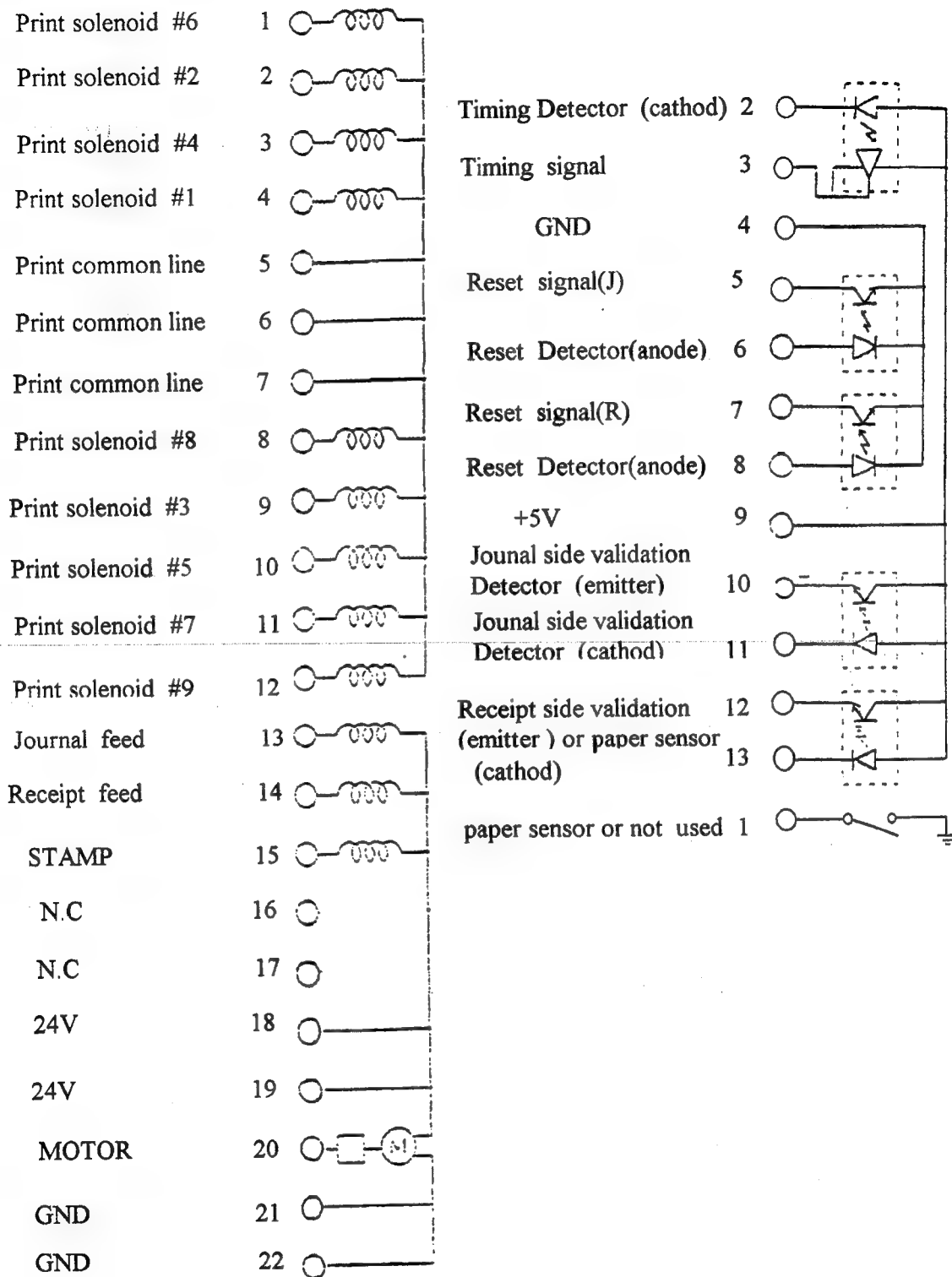
1) Receipt / Journal independent feed method

2) Fast feed speed :

Receipt : Approx. 26.5 lines/sec

Journal : Approx. 9.9 lines/sec

6-2 Printer Terminal Arrangement

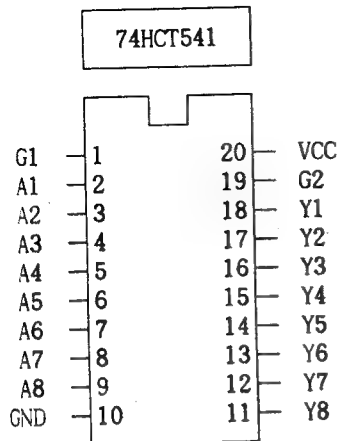


6-3 CPU PORT(8032/8052)

| FUNCTION | I/O | NAME | CPU PIN |
|------------------|-----|-------|---------|
| DRAWER1 | 0 | P1.0 | 1 |
| DRAWER2 | 0 | P1.1 | 2 |
| COMPULSORY | I | P1.2 | 3 |
| LE(DISPLAY) | 0 | P1.3 | 4 |
| BUZZER | 0 | P1.4 | 5 |
| NE555 TRIGGER | 0 | P1.5 | 6 |
| RAM /CS | 0 | P1.6 | 7 |
| RAM SELECTION | 0 | P1.7 | 8 |
| RESET | I | RESET | 9 |
| RXD(DISPLAY DI) | 0 | P3.0 | 10 |
| TXD(DISPLAY CLK) | 0 | P3.1 | 11 |
| INT0 | I | P3.2 | 12 |
| INT1 | I | P3.3 | 13 |
| MODE KEY | I | P3.4 | 14 |
| RAM SELECTION | I | P3.5 | 15 |
| /WR | I/O | P3.6 | 16 |
| /RD | I/O | P3.7 | 17 |
| X-TAL OUTPUT | 0 | XTAL2 | 18 |
| X-TAL INPUT | I | XTAL1 | 19 |
| VSS | - | GND | 20 |

| CPU PIN | NAME | I/O | FUNCTION |
|---------|-----------|-----|-------------------|
| 40 | VCC | I | +5V |
| 39 | P0.0(AD0) | I/O | ADDRESS DATA BUS |
| 38 | P0.1(AD1) | I/O | ADDRESS DATA BUS |
| 37 | P0.2(AD2) | I/O | ADDRESS DATA BUS |
| 36 | P0.3(AD3) | I/O | ADDRESS DATA BUS |
| 35 | P0.4(AD4) | I/O | ADDRESS DATA BUS |
| 34 | P0.5(AD5) | I/O | ADDRESS DATA BUS |
| 33 | P0.6(AD6) | I/O | ADDRESS DATA BUS |
| 32 | P0.7(AD7) | I/O | ADDRESS DATA BUS |
| 31 | /EA | I | GND |
| 30 | ALE | 0 | ADDS LATCH ENABLE |
| 29 | /PSEN | 0 | PGM STORE ENABLE |
| 28 | P2.7(A15) | I/O | ADDRESS BUS |
| 27 | P2.6(A14) | I/O | ADDRESS BUS |
| 26 | P2.5(A13) | I/O | ADDRESS BUS |
| 25 | P2.4(A12) | I/O | ADDRESS BUS |
| 24 | P2.3(A11) | I/O | ADDRESS BUS |
| 23 | P2.2(A10) | I/O | ADDRESS BUS |
| 22 | P2.1(A9) | I/O | ADDRESS BUS |
| 21 | P2.0(A8) | I/O | ADDRESS BUS |

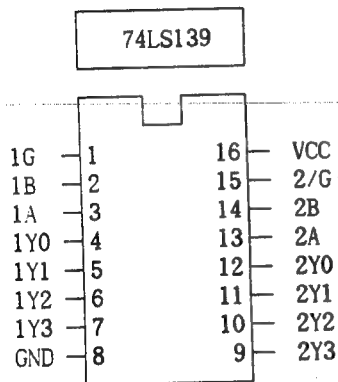
6-4 GENERAL SPECIFICATION OF ICs



FUNCTION TABLE
(HCT541)

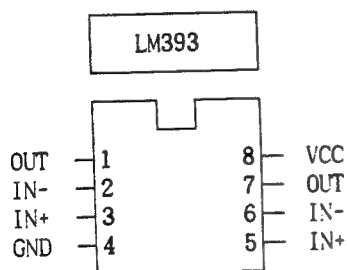
| INPUT | | | OUTPUT Y |
|-------|----|---|-------------|
| G1 | G2 | A | |
| L | L | L | L |
| L | L | H | H |
| H | X | X | Z |
| X | H | X | Z |

* Z = High Impedance



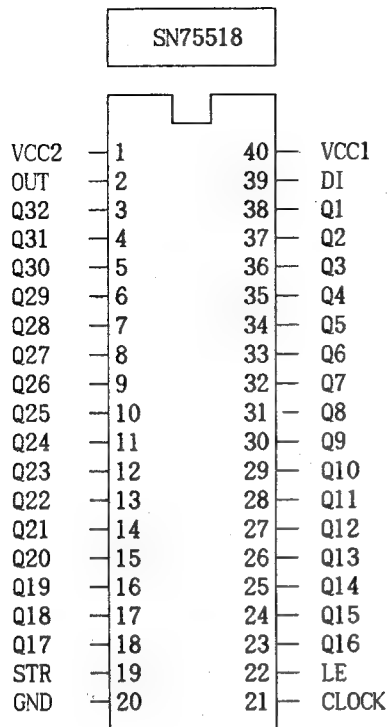
2-TO-4-LINE DECODERS/MULTIPLEXERS

| PIN NAME | PIN FUNCTION |
|----------|----------------------|
| 1Y0-1Y3 | DATA OUTPUTS(FIRST) |
| 2Y0-2Y3 | DATA OUTPUTS(SECOND) |
| 1G | ENABLE(FIRST) |
| 2G | ENABLE(SECOND) |

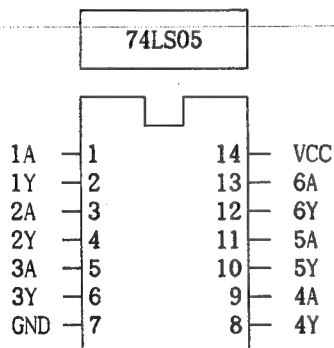


FUNCTION TABLE

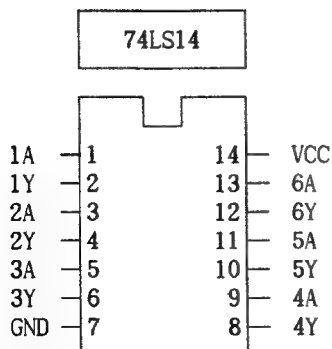
| INPUTS | | OUTPUTS | | | |
|-------------|--------|---------|----|----|----|
| ENABLE G | SELECT | | | | |
| | B A | Y0 | Y1 | Y2 | Y3 |
| H | X X | H | H | H | H |
| L | L L | L | H | H | H |
| L | L H | H | L | H | H |
| L | H L | H | H | L | H |
| L | H H | H | H | H | L |



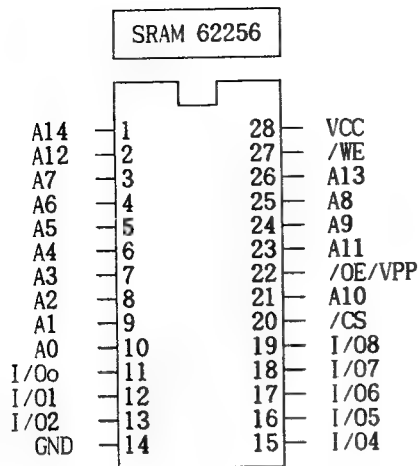
| SN75518 | |
|----------|--------------|
| PIN NAME | PIN FUNCTION |
| Q1 - Q32 | DATA OUTPUTS |
| VCC2 | +24V |
| VCC1 | +5V |
| DI | DATA INPUT |
| LE | LATCH ENABLE |
| GND | GROUND |
| STR | STROBE |
| OUT | SERIAL OUT |
| GND | GROUND |



| HEX INVERTED BUFFERS | |
|----------------------|------------------|
| PIN NAME | PIN FUNCTION |
| 1A - 6A | INPUTS(EACH) |
| 1Y - 6Y | INVERTED OUTPUTS |

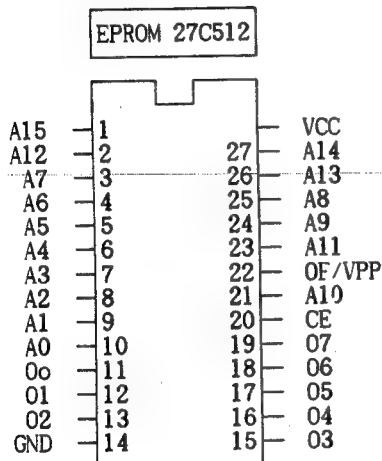


| HEX SCHMITT-TRIGGER INVERTERS | |
|-------------------------------|------------------|
| PIN NAME | PIN FUNCTION |
| 1A - 6A | INPUTS(EACH) |
| 1Y - 6Y | INVERTED OUTPUTS |



SRAM 62256 (32K X 8)

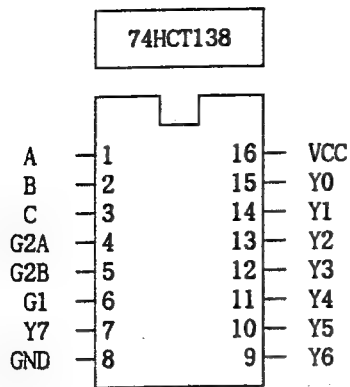
| PIN NAME | PIN FUNCTION |
|-------------|-------------------|
| A0 - A14 | ADDRESS INPUT |
| I/O0 - I/O7 | DATA INPUT/OUTPUT |
| VCC | DEVICE POWER(+5V) |
| VSS | GROUND |



EPROM 27C512 (64K)

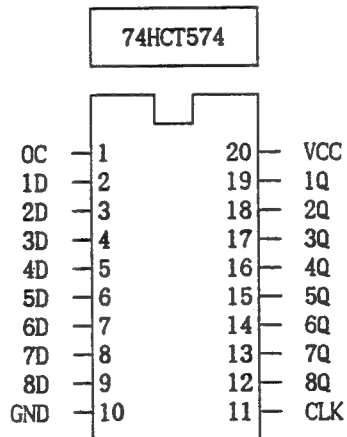
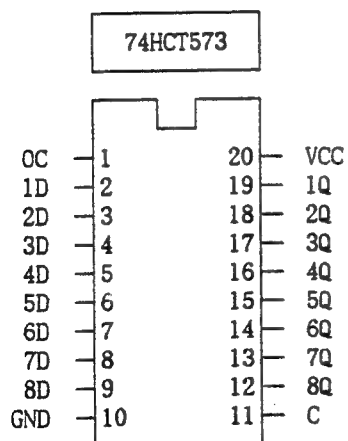
| PIN NAME | PIN FUNCTION |
|----------|-------------------|
| A0 - A15 | ADDRESS |
| CE | CHIP ENABLE |
| OE / VPP | OUTPUT ENABLE/VPP |
| O0 - O7 | DATA INPUT/OUTPUT |
| VCC | POWER SUPPLY (5V) |
| GND | GROUND |
| N.C | NO CONNECTION |

| 27512 27C512 | 27128A 27C128 | 2764A 27C64 | 2732A | 2716 | 2716 | 2732A | 2764A 27C64 | 27128A 27C128 | 27512 27C512 |
|-----------------|------------------|----------------|-------|------|------|--------|----------------|------------------|-----------------|
| A15 | VPP | VPP | | | | | VCC | VCC | VCC |
| A12 | A12 | A12 | | | | | PGM | PGM | A14 |
| A7 | A7 | A7 | A7 | A7 | VCC | VCC | NC | A13 | A13 |
| A6 | A6 | A6 | A6 | A6 | A8 | A8 | A8 | A8 | A8 |
| A5 | A5 | A5 | A5 | A5 | A9 | A9 | A9 | A9 | A9 |
| A4 | A4 | A4 | A4 | A4 | VPP | A11 | A11 | A11 | A11 |
| A3 | A3 | A3 | A3 | A3 | OE | OE/VPP | OE | OE | OE/VPP |
| A2 | A2 | A2 | A2 | A2 | A10 | A10 | A10 | A10 | A10 |
| A1 | A1 | A1 | A1 | A1 | CE | CE | CE | CE | CE |
| A0 | A0 | A0 | A0 | A0 | O7 | O7 | O7 | O7 | O7 |
| O0 | O0 | O0 | O0 | O0 | O6 | O6 | O6 | O6 | O6 |
| O1 | O1 | O1 | O1 | O1 | O5 | O5 | O5 | O5 | O5 |
| O2 | O2 | O2 | O2 | O2 | O4 | O4 | O4 | O4 | O4 |
| GND | GND | GND | GND | GND | O3 | O3 | O3 | O3 | O3 |

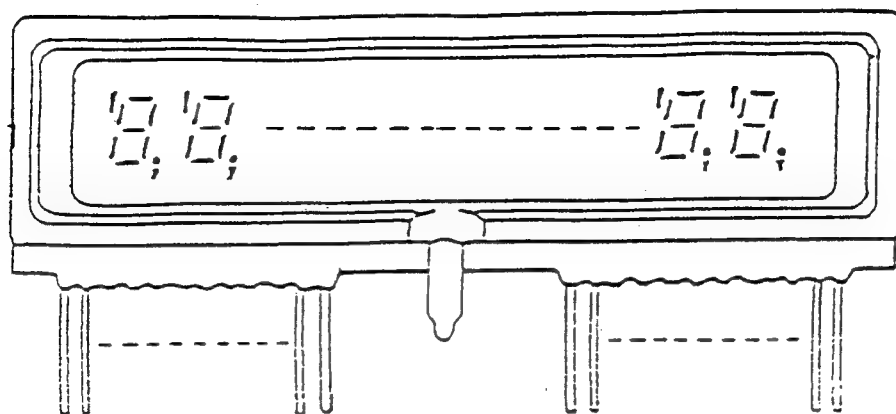


FUNCTION TABLE

| INPUTS | | | | | OUTPUTS | | | | | | | |
|--------|-----|--------|---|---|---------|----|----|----|----|----|----|----|
| ENABLE | | SELECT | | | | | | | | | | |
| G1 | G2* | C | B | A | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 |
| X | H | X | X | X | H | H | H | H | H | H | H | H |
| L | X | X | X | X | H | H | H | H | H | H | H | H |
| H | L | L | L | L | L | H | H | H | H | H | H | H |
| H | L | L | L | H | H | L | H | H | H | H | H | H |
| H | L | L | H | L | H | H | L | H | H | H | H | H |
| H | L | L | H | H | H | H | H | L | H | H | H | H |
| H | L | H | L | L | H | H | H | H | L | H | H | H |
| H | L | H | L | H | H | H | H | H | H | L | H | H |
| H | L | H | H | L | H | H | H | H | H | H | L | H |
| H | L | H | H | H | H | H | H | H | H | H | H | L |



6-5.DIGITRON FG97D6/FG97M6/FG1010RB1



FG1010RB1 1-----11 12-----22
 FG97D6 1-----12 13-----24
 FG97M6

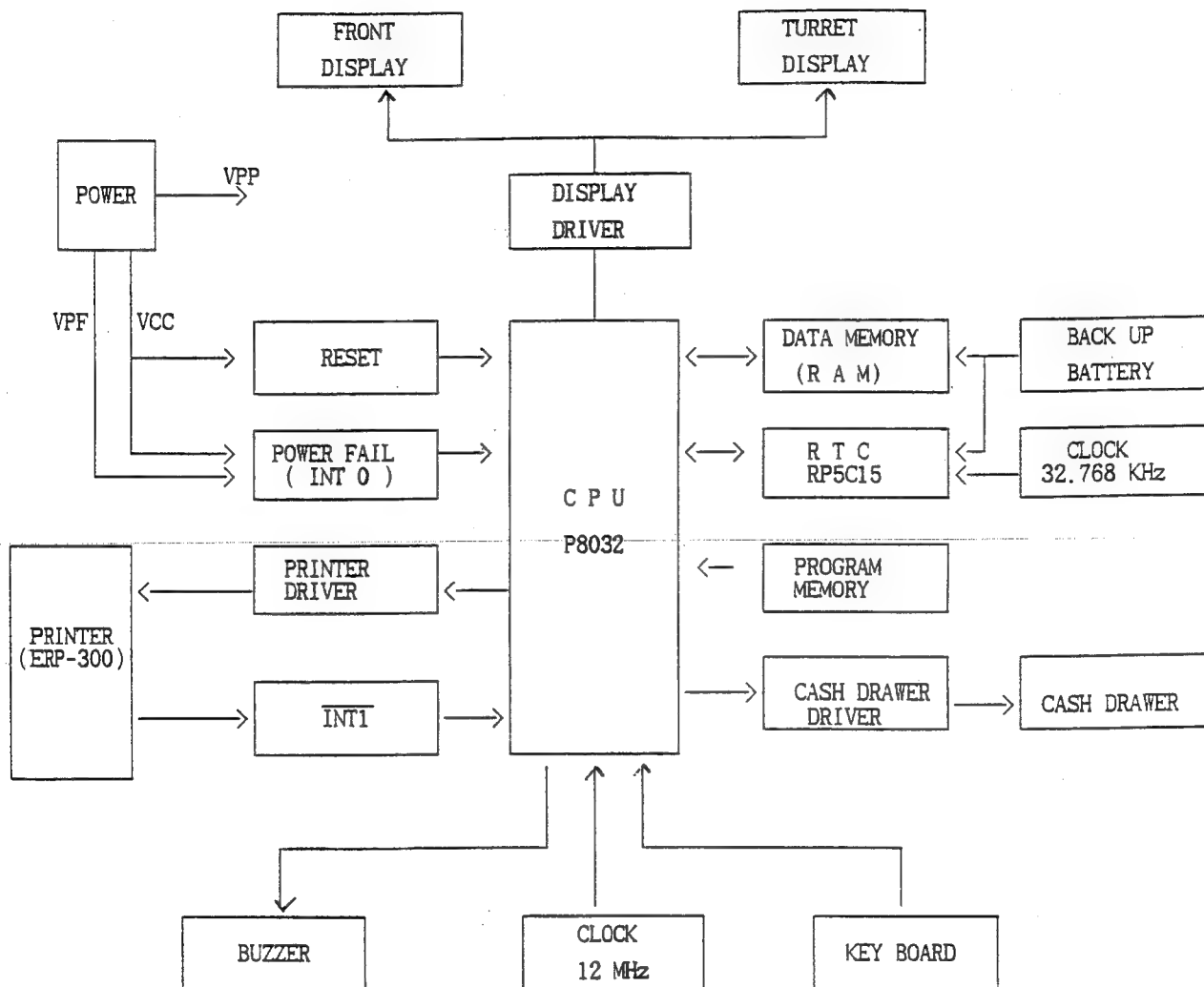
FG97D6 / FG97M6

| | | | |
|--------------|----------------|--------------|---------------|
| 1: FILAMENT | 2: PLATE(AP) | 3: PLATE(f) | 4: PLATE(g) |
| 5: PLATE(e) | 6: N.C. | 7: N.C. | 8: N.C. |
| 9: GRID(9) | 10: GRID(8) | 11: GRID(7) | 12: GRID(6) |
| 13: GRID(5) | 14: GRID(4) | 15: GRID(3) | 16: GRID(2) |
| 17: GRID(1) | 18: PLATE(COM) | 19: PLATE(d) | 20: PLATE(dp) |
| 21: PLATE(c) | 22: PLATE(b) | 23: PLATE(a) | 24: FILAMENT |

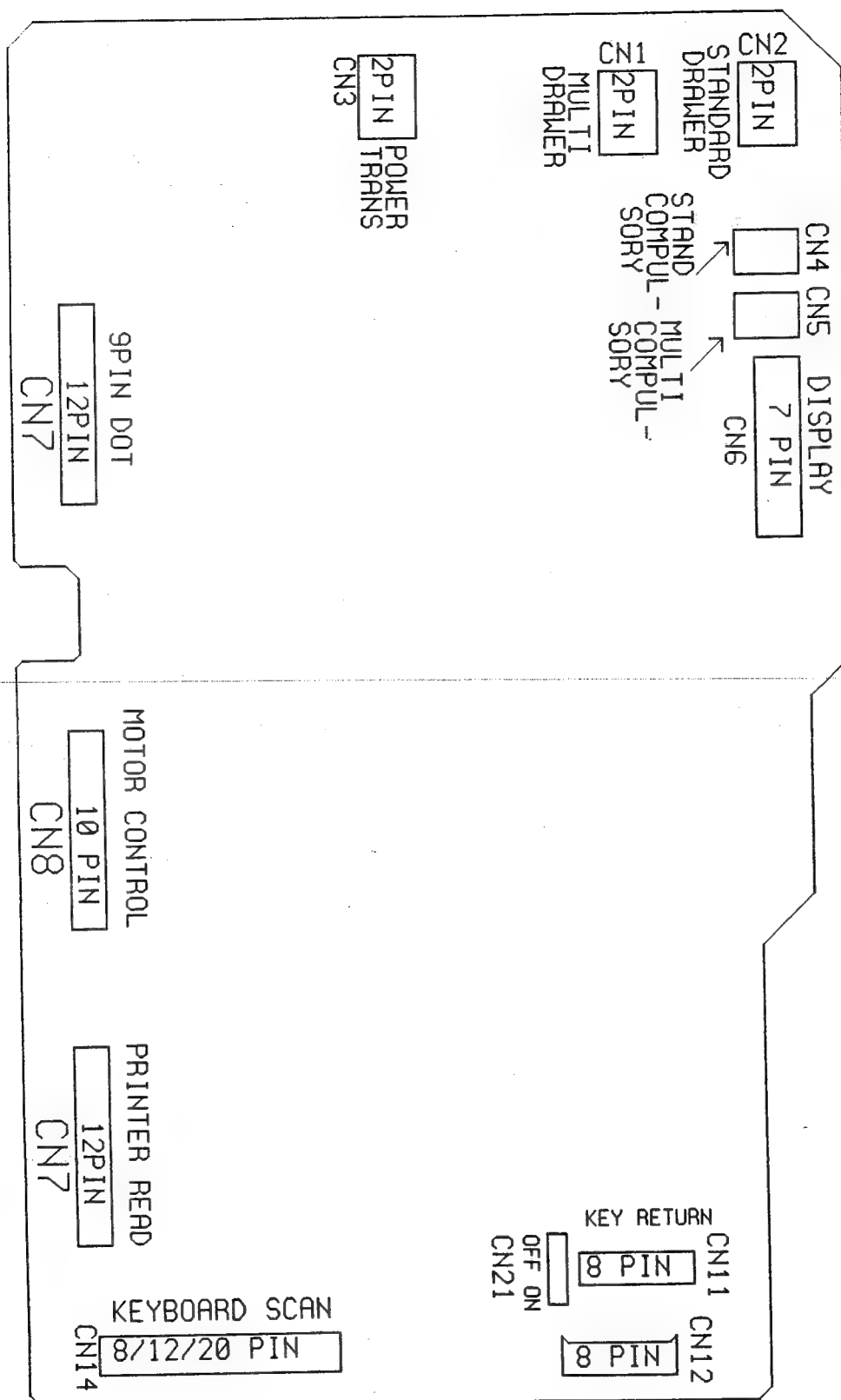
FG1010RB1
 PIN ASSIGNMENT

| | | | |
|----------------|--------------|--------------|--------------|
| 1: FILAMENT | 2: PLATE(f) | 3: PLATE(g) | 4: PLATE(e) |
| 5: PLATE(dp) | 6: PLATE(h) | 7: GRID(10) | 8: GRID(9) |
| 9: GRID(8) | 10: GRID(7) | 11: GRID(6) | 12: GRID(5) |
| 13: GRID(4) | 14: GRID(3) | 15: GRID(2) | 16: GRID(1) |
| 17: PLATE(COM) | 18: PLATE(d) | 19: PLATE(c) | 20: PLATE(b) |
| 21: PLATE(a) | 22: FILAMENT | | |

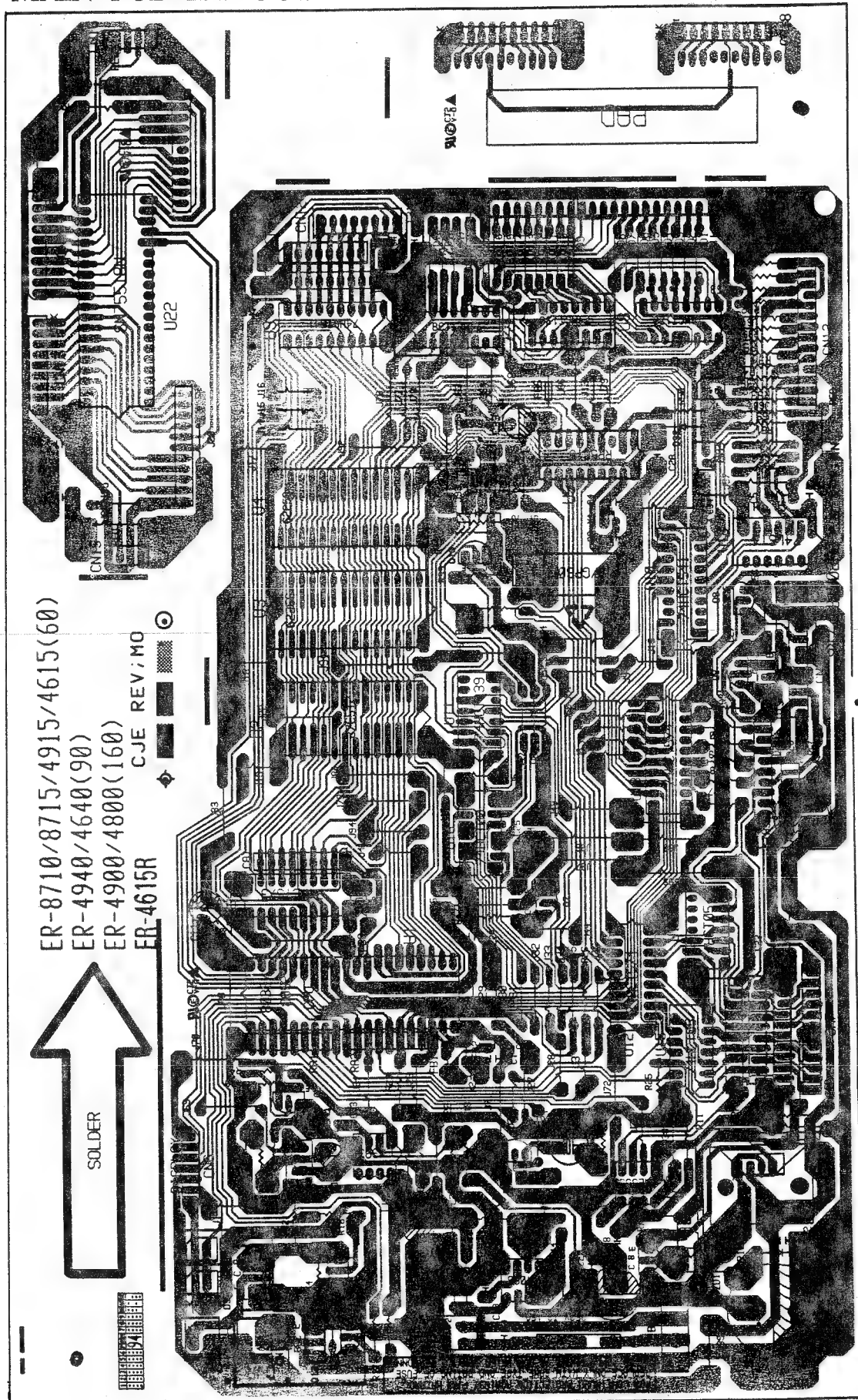
7. General overview System Block Diagram



DISASSEMBLY MAIN PCB



MAIN PCB LAYOUT



PARTS LIST

8. PART LIST

A. ASSY COVER PRINTER

| LO.NO | CODE NUMBER | SPECIFICATION | Q'TY | REMARK |
|-------|--------------|------------------------------------|------|--------|
| A1 | 825 139173MA | INC, BRAND-PANEL; PVC T0.3 | 1 | |
| A2 | 821 390149AA | PLT, COVER-PRINTER; ABS(V0), T3.0 | 1 | |
| A2-1 | 813 390019AA | IMP, CUTTER-PAPER; SUS304-CP T0.3 | 1 | |
| A3 | 831 561002AA | COM, LOCK KEY ASS'Y; COVER-PRINTER | 1 | |
| A4 | 813 390024AA | IMP, CLIP-PLATE; SMP T0.5 | 1 | |
| A5 | 821 390150AA | PLT, WINDOW-JOURNAL; ACRYL T2.0 | 1 | |

B. ASSY TURRET

| | | | | |
|----|--------------|--------------------------------|---|--|
| B1 | 821 390152AB | PLT, WINDOW-TURRET; PC T3.0 | 1 | |
| B2 | 827 159038AA | PAC, PAD-TURRET; RUBBER-SPONGE | 2 | |
| B3 | 895 449005AA | DISPLAY LCD | 1 | |
| B4 | 821 390151AA | PLT, TURRET-BODY; ABS(V0) T3.0 | 1 | |

C. ASSY UPPER

| | | | | |
|-----|---------------|--|---|----------|
| C1 | 825 139375PE | INC, PLATE-MODE S/W; PVC T0.3 | 1 | ER-4915 |
| C1 | 825 139375PF | INC, PLATE-MODE S/W; PVC T0.3 | 1 | ER-4940 |
| C1 | 825 139375PG | INC, PLATE-MODE S/W; PVC T0.3 | 1 | ER-4900 |
| C1 | 825 139375PK | INC, PLATE-MODE S/W; PVC T0.3 | 1 | ER-4615 |
| C1 | 825 139375PL | INC, PLATE-MODE S/W; PVC T0.3 | 1 | ER-4640 |
| C1 | 825 139375PM | INC, PLATE-MODE S/W; PVC T0.3 | 1 | ER-4800 |
| C1 | 825 139375SA | INC, PLATE-MODE S/W; PVC T0.3 | 1 | ER-4615R |
| C2 | 821 390154AA | PLT, CASE-UPPER; ABS(V0) T0.3 | 1 | |
| C3 | 842 343022AB | TAPPING, PH+, 2, M3, L10; PH, +, 2, M3, L10, ZPC3 | 2 | |
| C4 | 28343-700-210 | SWITCH-KEY LOCK Z; Z, 5L 11110 | 2 | |
| C5 | 28343-700-212 | SWITCH-KEY LOCK C; C, 5L 11112 | 2 | |
| C6 | 933 230034KB | SWITCH-KEY LOCK, KEY-B; VD, 5L 11109 | 2 | |
| C7 | 933 230034KC | SWITCH-KEY LOCK, KEY-C; P, 5L, 11111 | 2 | |
| C8 | 933 230034KE | SWITCH-KEY LOCK(REG); REG 5L 11201 | 2 | |
| C9 | 933 230034AA | SWITCH ROTARY, 10; -, 12VDC, 30MA, 1 | 1 | |
| C10 | 821 390153AD | PLT, WINDOW-DISPLAY; PC(LEXAN 141) | 1 | |
| C11 | 841 810022AA | MACHINE, SCREW, FH+, M3X60; NO, FH, +, M3, L60 | 1 | |
| C12 | 842 840007BG | TAPPING, PH+, W, 2S, M3, L10; PH, +, 2, M3, L10, ZPC3, SM20C | 1 | |

D. ASSY DISPLAY

| | | | | |
|----|--------------|--|---|--|
| D1 | 842 840009AA | TAPPING, PH+, W, 2S, M3, L8; PH, +, 2, M3, L8, ZPC3, SM20C | 2 | |
| D2 | 895 440005AA | DISPLAY LCD, 10DIZ | 1 | |
| D3 | 813 390120AA | IMP, BRKT-DISPLAY; SBHG T1.2 | 1 | |
| D4 | 842 840009AA | TAPPING, PH+, W, 2S, M3, L8; PH, +, 2, M3, L8, ZPC3, SM20C | 3 | |

E. ASSY KEY-BOARD

| | | | | |
|----|----------------|--------------------------------|---|------------------|
| E1 | 353 031054AAGA | KEY-BOARD ASS'Y; MEMBRANE TYPE | 1 | ER-4915 |
| E1 | 353 031054AAHA | KEY-BOARD ASS'Y; MEMBRANE TYPE | 1 | ER-4940 |
| E1 | 353 031054AAJA | KEY-BOARD ASS'Y; MEMBRANE TYPE | 1 | ER-4800/4900 |
| E1 | 353 031054AAJB | KEY-BOARD ASS'Y; MEMBRANE TYPE | 1 | ER-4800(EUROPE) |
| E1 | 353 031054AAJC | KEY-BOARD ASS'Y; MEMBRANE TYPE | 1 | ER-4800(SPANISH) |
| E1 | 353 031054AAKA | KEY-BOARD ASS'Y; MEMBRANE TYPE | 1 | ER-4615 |
| E1 | 353 031054AAZA | KEY-BOARD ASS'Y; MEMBRANE TYPE | 1 | ER-4615R |
| E1 | 353 031055AABA | KEY-BOARD ASS'Y; MEMBRANE TYPE | 1 | ER-4640 |

F. ASSY PRINTER

| | | | | |
|----|----------------|---|---|--|
| F1 | 353 033106FBAB | IMPACT DOT-PRINTER; ERP-300 | 1 | |
| F2 | 842 840021AA | TAPPING, RH+, 2S, M4, L10; RH, +, 2, M4, L10, ZPC | 4 | |
| F3 | 821 397002AB | CUSHION-PRINTER; NR(BLACK) | 4 | |
| F4 | 811 390004CA | SUA, RIBBON-CASSETTE; 2785FN ERC-18 PURPLE | 1 | |

G. ASSY LOWER

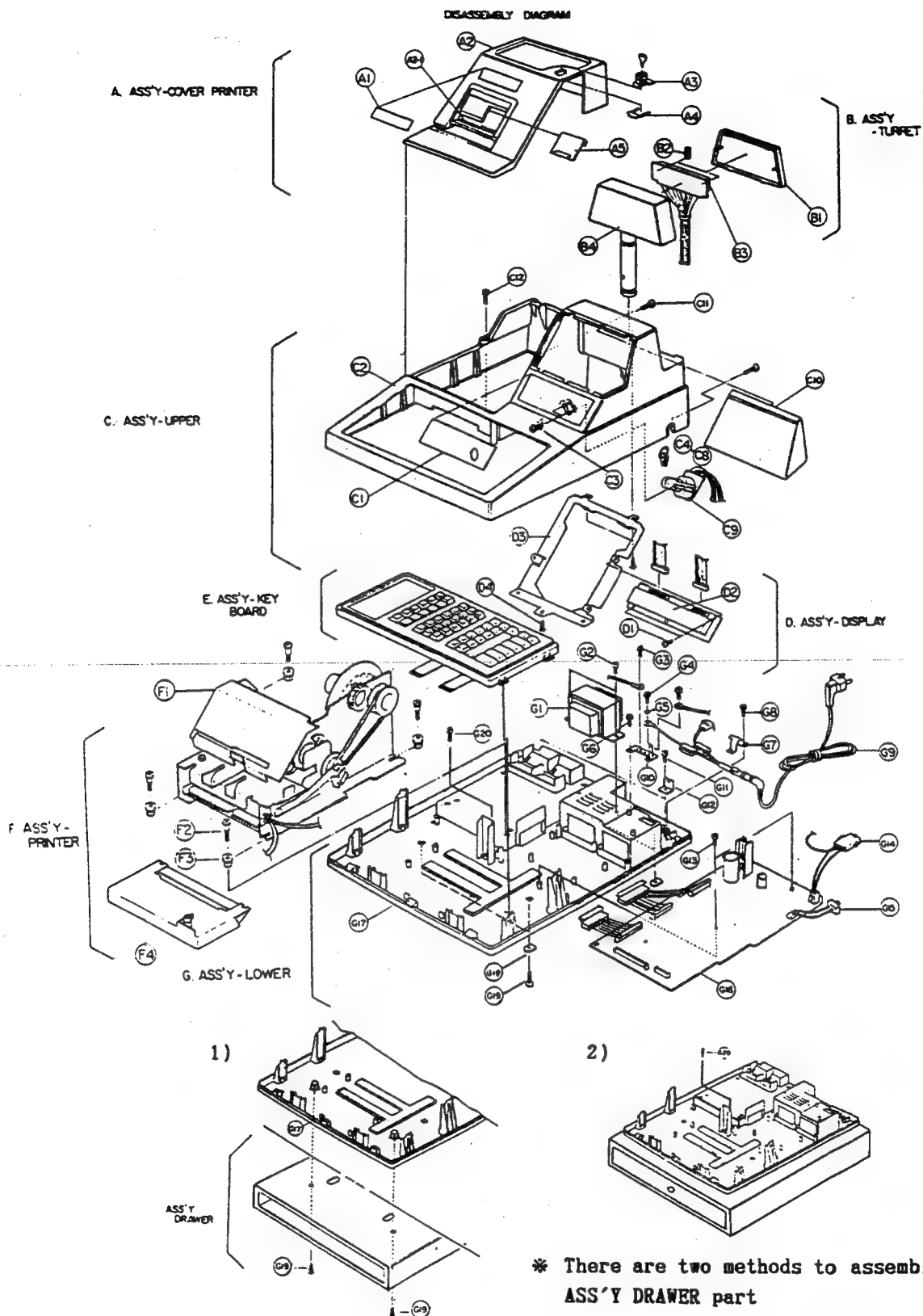
| | | | | |
|-----|----------------|--|---|-------------------------|
| G1 | 923 390008AA | TRANS-POWER; P: 120V, S: 24V, UL | 1 | ER-4915/4940/4900 |
| G1 | 923 390008BA | TRANS-POWER; P: 230V, S: 24V, TUV | 1 | ER-4615/4640/4800/4615R |
| G2 | 842 840030AA | TAPTITE, JOINT; BH+(S/W), M4, L10, ZN, SWRCH | 2 | |
| G3 | 842 840029AA | TAPPING, GROUND; RH+(OT/W), 2, M3, L3, ZN, SWRCH | 1 | |
| G4 | 847 507003AA | TAPTITE, GROUND; BH+(OT/W), M4, L8, ZN, SWRCH | 1 | |
| G5 | 855 134001BB | WASHER, TOOTHED, M4, ET; M4, ID4.3, OD8.5, T0.4 | 1 | |
| G6 | 842 840007BG | TAPPING, PH+, W, 2S, M3, L10; PH+, 2, M3, L10, ZPC3, SM20C | 1 | |
| G7 | 813 390012AA | IMP, HOLDER-CORD; SBHG1, T1.0 | 1 | |
| G8 | 842 840009AA | TAPPING, PH+, W, 2S, M3, L8; PH, +, 2, M3, L8, ZPC3, SM20C | 1 | |
| G9 | 955 001381AAAA | CBF-POWER CORD, 1600MM; DW-002(URUGUAY) | 1 | ER-4615/4640/4800 |
| G9 | 955 001382AAAA | CBF-POWER CORD, 1600MM; LTSA-3, 0.75(AUSTRALIA) | 1 | ER-4615/4640/4800 |
| G9 | 955 001384AAAA | CBF-POWER CORD, 1700MM; DW-200P(USA) | 1 | ER-4615/4940/4900 |
| G9 | 955 001385AAAA | CBF-POWER CORD, 1600MM; GTBS-3, HO5VV-F(NO PLUG) | 1 | ER-4615/4640/4800 |
| G9 | 955 001416AAAA | CBF-POWER CORD, 1700MM; GB13A4, HO5VV-F, 3GX1(U.K) | 1 | ER-4615/4640/4800 |
| G9 | 955 001449AAAC | CBF-POWER CORD, 1780MM; KKP-4819D, HO5VV-F(EUROPE) | 1 | ER-4615/4640/4800 |
| G10 | 813 390119AA | IMP, GROUND-PLATE; T1.2 | 1 | |
| G11 | 842 344022AB | TAPPING, PH+, 2, M4, L10; PH, +, 2, M4, L10, ZPC3, SM20C | 2 | |
| G12 | 813 390013AA | IMP, BRKT-CASING; SBHG1 T1.6 | 2 | |
| G13 | 842 840009AA | TAPPING, PH+, W, 2S, M3, L8; PH, +, 2, M3, L8, ZPC3, SM20C | 3 | |
| G14 | 955 390062AAAA | CBF-CONN ASS'Y, 100MM, 3P; M-E 2103 IN | 1 | ER-4915/4940/4900 |
| G14 | 955 390055AAAA | CBF-CONN ASS'Y, 185MM, 3P; SMP-03V-CBF | 1 | ER-4615/4640/4800 |
| G17 | 821 390155AA | PLT, CASE-LOWER; ABS(V0) T3.0 | 1 | |
| G18 | 813 390018AC | IMP, BRKT-FOOT; SCP1 T1.6 | 2 | |
| G19 | 842 344022AB | TAPPING, PH+, 2, M4, L10; PH, +, 2, M4, L10, ZPC3, SM20C | 2 | |
| G20 | 847 501009CA | SPECIAL, TAPTITE, PH+, W, M4; S, PH, +, M4, L8, ZPC3, SWRCH18A | 1 | |

ASSY-MAIN PCB

| LO.NO | CODE NUMBER | 규격 | Q'TY | 비고 |
|-------|----------------|---------------------------|------|-------------------|
| | 353 031066AAAA | ASS'Y MAIN PCB(ER-4915) | 1 | ER-4915 |
| | 353 031066AAAB | ASS'Y MAIN PCB(ER-4940) | 1 | ER-4940 |
| | 353 031066AAAC | ASS'Y MAIN PCB(ER-4900) | 1 | ER-4900 |
| | 353 031066AAAD | ASS'Y MAIN PCB(ER-4615) | 1 | ER-4615 |
| | 353 031066AAAE | ASS'Y MAIN PCB(ER-4640) | 1 | ER-4640 |
| | 353 031066AAAF | ASS'Y MAIN PCB(ER-4800) | 1 | ER-4800 |
| | 353 031066AAAF | ASS'Y MAIN PCB(ER-4615R) | 1 | ER-4615R |
| | 22105-F83-620 | IC-SRAM:HM62256BP-25(SST) | 1 | |
| | 24719-006-010 | BATTERY-NICAD:3/60DK | 1 | |
| | 935 130049AB | BATTERY-LI,3V,950mAh | 1 | ER-4615R |
| | 353 033154AABA | ASSY HEAT SINK:45 + D73 | 1 | TR D73 |
| | 831 511011AB | COM,HEAT SINK:A6063 H45 | 1 | |
| | 842 840009AA | TAPPING,PH+,W,2S,M3,L8:PH | 1 | |
| | 891 490073AA | TR-NPN,KSD73,TO-220: | 1 | Q14 |
| | 821 397027AA | PLT,PAD-DIGITRON:RUBBER S | 2 | PCB |
| | 825 119334BA | INC,LABEL SERIAL:8.5*26.5 | 1 | PCB |
| | 825 119491AA | INC,ROM PROTECTOR:ART,12X | 1 | EPROM |
| | 873 275518AA | IC-MOS,75518,DRIVER:DIP,4 | 1 | U22 |
| | 877 108032AA | IC-MPU,8032,PROCESSOR:DIP | 1 | U1 |
| | 881 200393AAND | IC-LIN,393,COMPARATOR:DIP | 1 | U21 |
| | 881 334063AA | IC-LIN,34063,CONV.CONTRO: | 1 | U20 |
| | 881 800401UA | IC-LIN,401,TR ARRAY:SIP,1 | 3 | TA1,TA2,TA3 |
| | 881 900555AAND | IC-LIN,555,TIMING CKT.:DI | 1 | U19 |
| | 883 627512BAND | IC-MEM,EPROM,27512,64KX8: | 1 | U2 |
| | 887 135102SH | IC-HYB,R-NETWORK,10P:SIP, | 1 | RA4 |
| | 887 135153SG | IC-HYB,R-NETWORK,9P:SIP,9 | 1 | RA3 |
| | 887 135472SGSA | IC-HYB,R-NETWORK,9P:SIP,9 | 2 | RA1,RA2 |
| | 887 200013SA | IC-HYB,C-NETWORK,9P:SIP,9 | 1 | CA1 |
| | 891 490288BCNA | (S)TR-NPN,KSD288-Y,TO-220 | 1 | Q11 |
| | 893 290032AC | DIODE-ZEN,UZP-24B,DO-41:1 | 1 | ZD1 |
| | 893 315822AAND | DIODE-REC,1N5822,DO-210A: | 1 | D33 |
| | 893 399062AA | DIODE-REC,FM202,-:200V,-, | 1 | B.D2 |
| | 911 603307GB | REF-WW,0.33,5%,1W:-,-400 | 1 | R14 |
| | 917 123100LM | CAP-AL.ELEC,107M,2A:(T)10 | 2 | C10,C15 |
| | 917 844470HM | CAP-AL.ELE,478M,1H,22X40: | 1 | C15 |
| | 925 480005BA | COIL-CHOKE,140UH:TR-15,0. | 1 | L1 |
| | 935 144108AANA | CON-FLAT CABLE,8P,2.54:ST | 1 | CN12 |
| | 935 144112AANB | CON-FLAT CABLE,12P,2.54:S | 1 | CN14 |
| | 935 155128DC | CON-IC SOCKET,28P:DIP,STR | 1 | U2 |
| | 935 240102DA | CON-BOX HEADER,2P,2.5MM:1 | 4 | CN4/CN5/CN19/CN20 |
| | 935 240107DA | CON-BOX HEADER,7P,2.5MM:1 | 1 | CN6 |
| | 935 240108DA | CON-BOX HEADER,8P,2.5MM:1 | 1 | CN11 |
| | 935 240109DA | CON-BOX HEADER,9P,2.5MM:1 | 1 | CN17 |
| | 935 240110DA | CON-BOX HEADER,10P,2.5MM: | 1 | CN9 |
| | 935 240902DF | CON-WALL HEADER,2P,3.96MM | 2 | CN2,3 |
| | 935 355102DBNG | CON-SHUNT,2P,-,-,-,- | 1 | CN21 |
| | 939 010031AA | AUDIO-BUZZER:-,-,-,-,- | 1 | |
| | 941 110067UBNA | CRYSTAL,12M,50:HC-18/U,-, | 1 | X2 |
| | 941 110073AA | CRYSTAL,32.768K,20:DT-38, | 1 | X1 |
| | 949 115202SLNA | FUSE-GLASS TUBE,3,125:SLO | 1 | |
| | 955 390058AAAB | CBF-CONN ASSY,370MM,10P:5 | 1 | CN10 |
| | 955 390060AAAA | CBF-CONN ASSY,370MM,09P:5 | 1 | CN18 |
| | 955 390082AAAA | CBF-CONN ASSY,220MM,13P:H | 1 | CN13 |
| | 955 390083ABAA | CBF-CONN ASSY,210/230MM,2 | 1 | CN7,CN8 |
| | 955 390084ABAA | CBF-CONN ASSY,380MM,7P:52 | 1 | CN6 |

ASSY MAIN AUTO

| LO.NO | CODE NUMBER | 규격 | Q'TY | 비고 |
|-------|----------------|-----------------------------|------|----------------------|
| | 02169-201-077 | DIODE:1N4003(T) | 4 | D26/27/29/30 |
| | 871 760005AANF | IC-TTL,74LS05,INVERTER:DIP | 2 | U14,U15 |
| | 871 760014AANB | IC-MOS,74LS14,INVERTER:DIP | 1 | U18 |
| | 873 790000AB | IC-MOS,74HCT00,GATE:DIP | 1 | U16 |
| | 873 790138AC | IC-MOS,74HCT138,DECODER:DIP | 2 | U6,U8 |
| | 873 790139AC | IC-MOS,74HCT139,DECODER:DIP | 1 | U11 |
| | 873 790541AC | IC-MOS,74HCT541,BUFFER:DIP | 2 | U9,U10 |
| | 873 790573AC | IC-MOS,74HCT573,LATCH:DIP | 1 | U17 |
| | 873 790574AC | IC-MOS,74HCT574,LATCH:DIP | 2 | U12,U13 |
| | 881 700515AA | IC-LIN,5C15,TIME CLOCK:DIP | 1 | U5 |
| | 891 390006XA | TR-NPN,KSC945,T0-92:0.25W | 8 | Q2~Q7/Q9/Q10 |
| | 893 114148AANA | DIODE-SIG,1N4148,D0-35:75 | 17 | D1~D8/D17~D25 |
| | 893 290031EB | DIODE-ZEN,UZ-3.9B,D0-35: | 1 | ZD2 |
| | 893 399060AA | DIODE-REC,EK-04,D0-41:40V | 1 | D32 |
| | 911 125107DA | REF-CF,51,5%,1/4W:250V,-3 | 1 | R15 |
| | 911 131007DA | REF-CF,100,5%,1/4W:250V,- | 3 | R1,R2,R3 |
| | 911 132207DA | REF-CF,220,5%,1/4W:250V,- | 4 | R32~R35 |
| | 911 133307DA | REF-CF,330,5%,1/4W:250V,- | 2 | R20,R21 |
| | 911 135607DA | REF-CF,560,5%,1/4W:250V,- | 3 | R8,R9,R28 |
| | 911 138207DA | REF-CF,820,5%,1/4W:250V,- | 1 | R10 |
| | 911 141007DA | REF-CF,1K,5%,1/4W:250V,-3 | 11 | R16/17/R22~R27/29~31 |
| | 911 144707DA | REF-CF,4.7K,5%,1/4W:250V, | 11 | R43~R53 |
| | 911 146807DA | REF-CF,6.8K,5%,1/4W:250V, | 2 | R18,R19 |
| | 911 151007DA | REF-CF,10K,5%,1/4W:250V,- | 7 | R36~R42 |
| | 911 151807DA | REF-CF,18K,5%,1/4W:250V,- | 1 | R11 |
| | 911 152007DA | REF-CF,20K,5%,1/4W:250V,- | 1 | R6 |
| | 911 152207DA | REF-CF,22K,5%,1/4W:250V,- | 1 | R7 |
| | 911 154707DA | REF-CF,47K,5%,1/4W:250V,- | 2 | R4,R5 |
| | 911 451205DA | REF-MF,12K,1%,1/4W:250V,- | 1 | R12 |
| | 911 453605DB | REF-MF,36K,1%,1/4W:250V,- | 1 | R13 |
| | 915 312300HJHH | CAP-CERAMIC,300J,1H,SL:30 | 4 | C1 ~ C4 |
| | 915 323470HKPH | CAP-CERAMIC,471K,1H,Y5P:4 | 1 | C8 |
| | 915 325100HZVH | CAP-CERAMIC,103Z,1H,Y5V:1 | 1 | C7 |
| | 915 325470HZVH | CAP-CERAMIC,473Z,1H,Y5V:4 | 2 | C5,C6 |
| | 915 336100HZVH | CAP-CERAMIC,104Z,1H,Y5V:1 | 14 | C16/C20~C32 |
| | 916 166100HJAH | CAP-MYLAR,104J,1H,5P:100N | 3 | C17,C18,C19 |
| | 917 121220HM | CAP-AL.ELEC,225M,1H:(T)50 | 1 | C12 |
| | 917 122220HM | CAP-AL.ELEC,226M,1H:(T)50 | 1 | C13 |
| | 917 123100CM | CAP-AL.ELEC,107M,1C:(T)16 | 2 | C11,C14 |
| | 937 120204BA | MAG-CORE,FERRITE,BEAD:BEA | 6 | FB1~FB4,FB6,FB7 |
| | 937 120208AA | MAG-CORE,FERRITE,BEAD:BEA | 2 | FB5,FB8 |
| | 947 390002AB | PWB-MAIN,ER-3715D,1LAYER: | 1 | |
| | 955 005001AAAB | CBF-JUMPER WIRE,52MM:TAPP | 94 | J1 ~ J93,J95 |

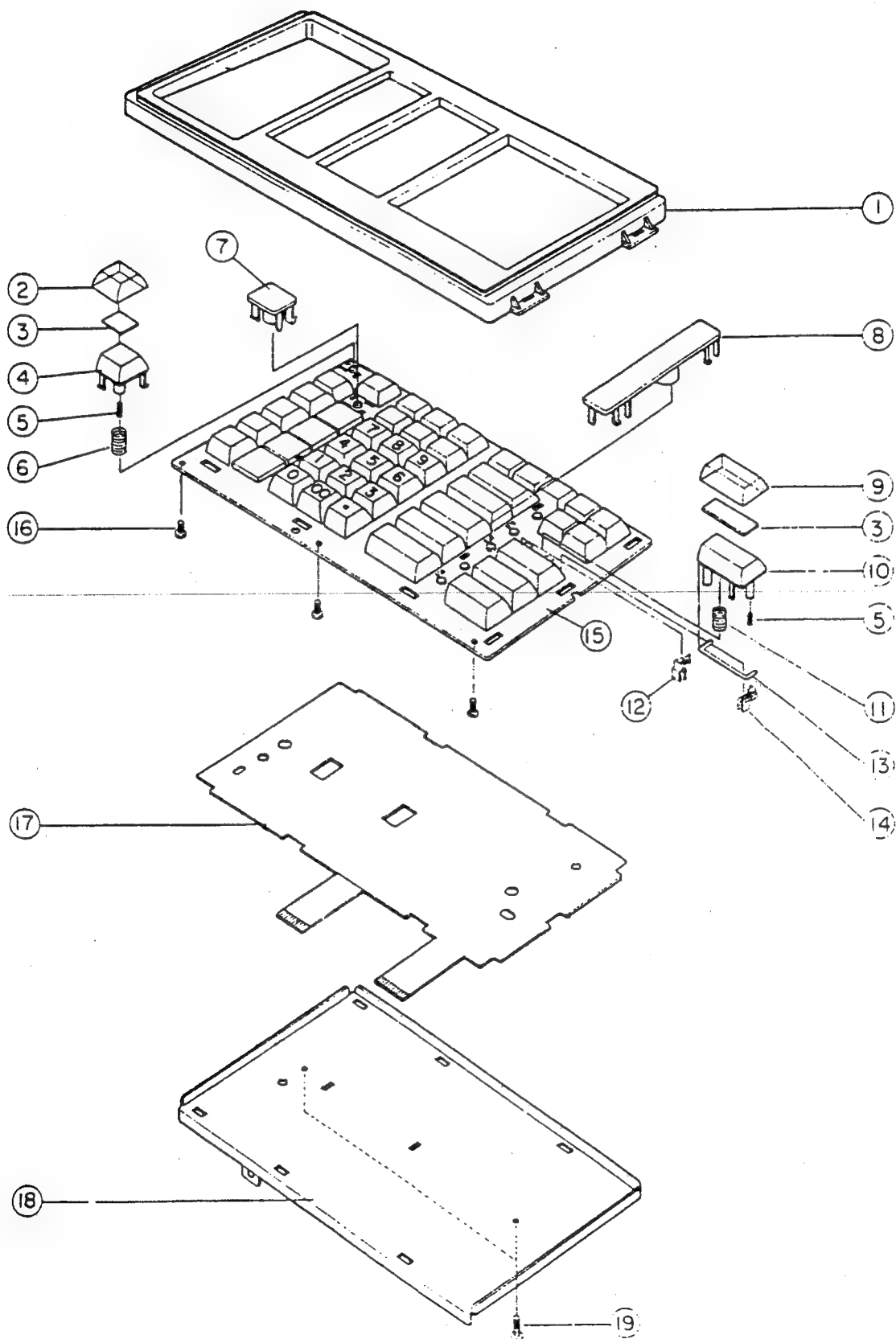


| NO | LO. NO | CODE NUMBER | DESCRIPTION/SPECIFICATION | Q'TY | REMARK |
|----|--------|--------------|---|------|--------|
| 1) | G19 | 842 444022AB | TAPPING, RH+, 2S, M4, L10 ; RH, +, 2, M4, ZPC | 2 | |
| 2) | G20 | 847 501009CA | SPECIAL, TAPTITE, PH+, W, M4 | 1 | |

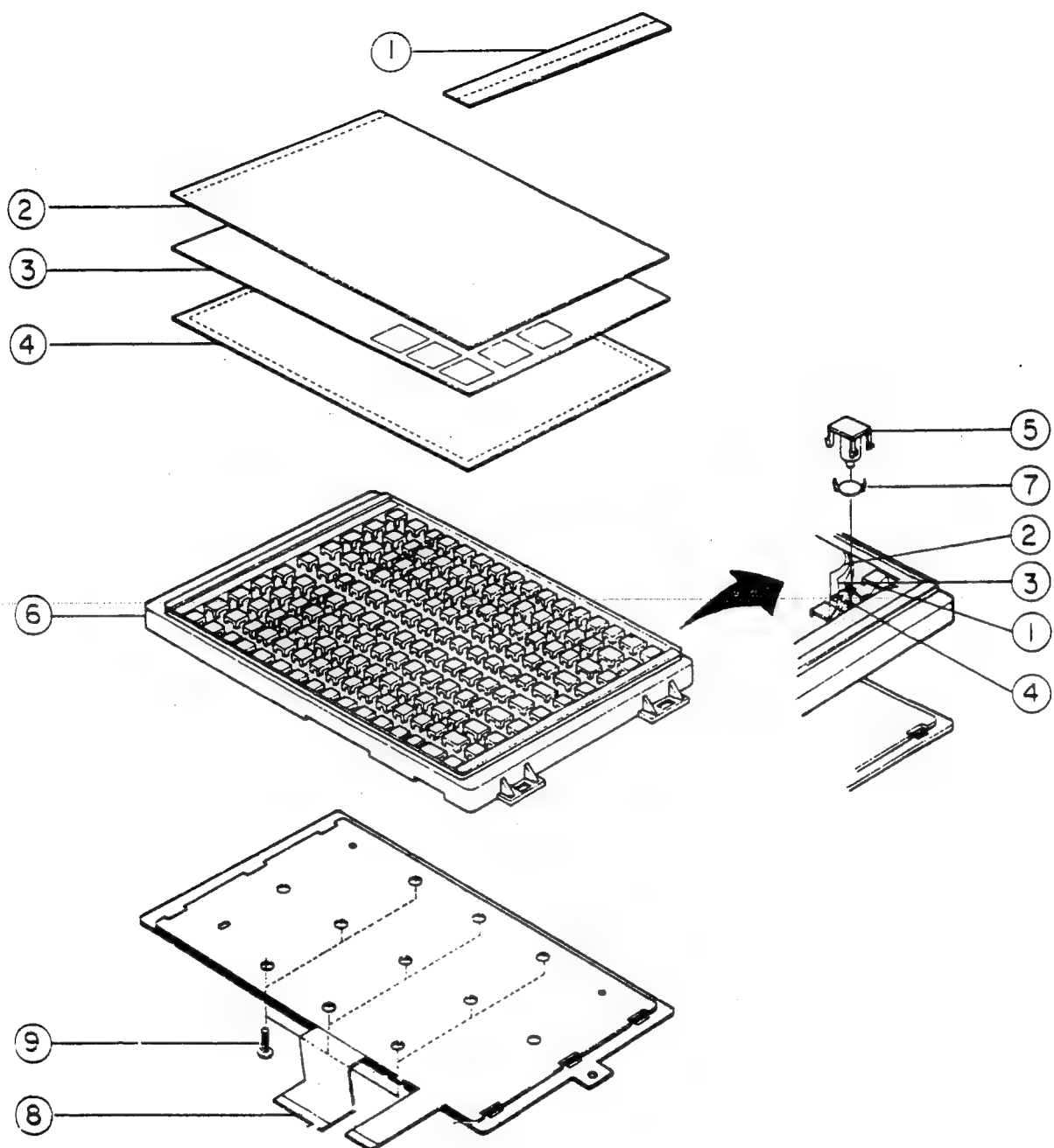
ASSY KEY-BOARD (MEMBRANE TYPE:60KEY/90KEY)

| LO.NO | CODE NUMBER | DESCRIPTION/SPECIFICATIONS | Q'TY | REMARKS |
|-------|----------------|--|------|---------|
| 1 | 821 390156AA | PLT,KBD-HOUSING:ABS(V0)-60KEY | 1 | |
| 1 | 821 390157AA | PLT,KBD-HOUSING:ABS(V0)-90KEY | 1 | |
| 2 | 27624-702-110 | KEY-CAP S:PC 1*1(S-Z0513-71 #01) | 0 | |
| 3 | 825 119331KA | INC,LABEL-KEY TOP SET:MOJO 100GR | 1 | |
| 4 | 27623-701-310 | KEY-TOP S:ABS 1*1(302KAS-014-01) | 1 | |
| 5 | 26674-710-810 | COIL-SPRING:SUS CONTACT(601KAS-001-01) | 1 | |
| 6 | 26674-710-610 | COIL-SPRING:SWPA RETURN 1*1U(601KAS) | 1 | |
| 9 | 27624-702-210 | KEY-CAP L:PC 1*2(S-Z0513-75 #01) | 1 | |
| 10 | 821 390160AA | PLT,KEY-TOP(1*2):302 KAS-032-00,ABS | 1 | |
| 11 | 831 522056AA | COM,COIL-SPRING RETURN,1*2 | 1 | |
| 12 | 821 390158AA | PLT,HOOK-A:541KAS-001-01 ,POM | 1 | |
| 13 | 813 390124AA | IMP,SPACE-BAR:321KAS-019-90,SUS 304 | 1 | |
| 13 | 813 390124AA | IMP,SPACE-BAR:321KAS-019-90,SUS 304 | 11 | |
| 13 | 813 390124AA | IMP,SPACE-BAR:321KAS-019-90,SUS 304 | 6 | |
| 14 | 821 390158BA | PLT,HOOK-B:541KAS-002-01 ,POM | 9 | |
| 15 | 821 390139AA | PLT,FRAME:POM T1.6 | 1 | |
| 15 | 821 390144AA | PLT,FRAME:POM T1.6 | 1 | |
| 16 | 842 840009AA | TAPPING PH,W,2S,M3,L8,PH,L8,ZPC3,SM20C | 8 | |
| 17 | 353 033055AAAA | FPC-ASSY | 1 | |
| 17 | 821 390140AA | PLT,FPC-A | 1 | |
| 17 | 821 390141AA | PLT,FPC-B | 1 | |
| 17 | 353 033055AAAC | FPC-ASSY | 1 | |
| 17 | 821 390140BA | PLT,FPC-A:PETP T0.125 | 1 | |
| 17 | 821 390141BA | PLT,FPC-B:PETP T0.125 | 1 | |
| 18 | 813 390121AA | IMP,BASE-PLATE:SECC T0.8 | 1 | |
| 18 | 813 390122AA | IMP,BASE-PLATE:SECC T0.8 | 1 | |
| | 23554-701-410 | SWITCH-KEY TOP 0:ABS(302KAS-019-05) | 1 | |
| | 23554-701-010 | SWITCH-KEY TOP 00:ABS(302KAS-017-31) | 1 | |
| | 23554-701-110 | SWITCH-KEY TOP .:ABS(302KAS-017-32) | 1 | |
| | 23554-700-210 | SWITCH-KEY TOP 1:ABS(302KAS-017-21) | 1 | |
| | 23554-700-310 | SWITCH-KEY TOP 2:ABS(302KAS-017-22) | 1 | |
| | 23554-700-410 | SWITCH-KEY TOP 3:ABS(302KAS-017-23) | 1 | |
| | 23554-700-510 | SWITCH-KEY TOP 4:ABS(302KAS-017-24) | 1 | |
| | 23554-701-310 | SWITCH-KEY TOP 5:ABS(302KAS-018-05) | 1 | |
| | 23554-700-610 | SWITCH-KEY TOP 6:ABS(302KAS-017-26) | 1 | |
| | 23554-700-710 | SWITCH-KEY TOP 7:ABS(302KAS-017-27) | 1 | |
| | 23554-700-810 | SWITCH-KEY TOP 8:ABS(302KAS-017-28) | 1 | |
| | 23554-700-910 | SWITCH-KEY TOP 9:ABS(302KAS-017-29) | 1 | |
| | 842 840009AA | TAPPING,PH+,W,2S,M3,L8:PH,+,2,M3,L8 | 8 | |
| 19 | 842 343022AB | TAPPING,PH+,2,M3,PH+,L10,PH,ZPC3,SM20C | 2 | |

ASS'Y Keyboard Disassembly : membrane type



ASS'Y Keyboard Disassembly : flat type



DRAWER

A.ASSY-BILL COIN

| LO.NO | CODE NUMBER | DESCRIPTION/SPECIFICATIONS | Q'TY | REMARKS |
|-------|---------------|--|------|---------|
| A | 2D902-701-077 | ASSY BILL COIN | 1 | |
| A1 | 821 390002AA | PLT, LEVER PRESS: ACETAL, BLK | 4 | |
| A2 | 831 521006AA | COM, SPRING-LEVER PRESS: SUS-WH PI0.3 | 4 | |
| A3 | 813 390014AA | PLT, HOLDER-PRESS, ACETAL, BLK | 4 | |
| A4 | 841 613008BB | MACHINE, SCREW, BH+, M3X6: NO, BH, +, M3, L6, ZP | 3 | |
| A5 | 842 343008AB | TAPPING, PH+, 2, M3, L6: PH, +, 2, M3, L6, ZPC3, S | 4 | |
| A6 | 813 390002AA | IMP HOLDER-PLATE: SBHG T1.2 | 1 | |
| A7 | 821 390005AA | PLT, PARTITION-BILL: HIPS(HB) | 3 | |

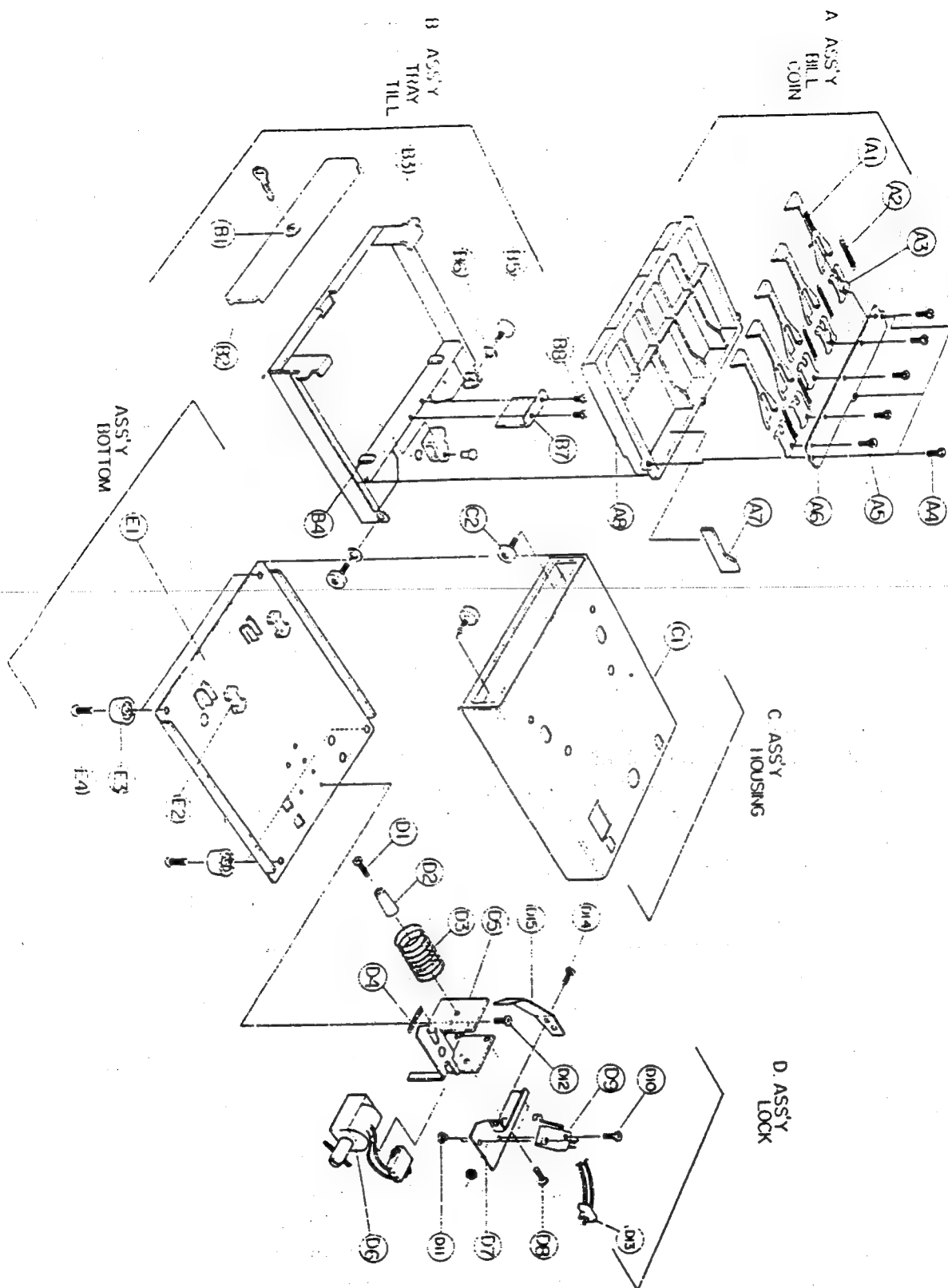
B.ASSY-TRAY TILL

| | | | | |
|----|---------------|--|---|--|
| B | 2D902-701-051 | ASSY TRAY | 1 | |
| B1 | 831 561002AB | COM, LOCK KEY ASSY | 1 | |
| B2 | 813 390036AA | IMP, PANEL-FRONT: SBC1 T1.0 | 1 | |
| B3 | 2D903-701-076 | ASSY-SUB TRAY | 1 | |
| | 813 390025AA | IMP, SUPPORT-TRAY BRACKET: SBHG-1 T1.2 | 1 | |
| | 813 390034AA | IMP, TRAY-TILL: SBHG-1 T1.2 | 1 | |
| | 813 390053AA | IMP, BRACKET-SHAFT LOCK: SBHG-1 T1.5 | 1 | |
| | 813 390055AA | IMP, SUPPORT-TRAY: SBHG-1 T1.2 | 1 | |
| | 813 390056AA | IMP, SUPPORT-PANEL LH: SBHG-1 T1.5 | 1 | |
| | 813 390057AA | IMP, SUPPORT-PANEL RH: SBHG-1 T1.5 | 1 | |
| | 853 126001BB | NUT, HEX, 2-M6: HEX, 2, M6, -, ZPC3, SM20C, | 1 | |
| B4 | 821 390062AA | PLT, SPONGE-TENSION: SPONGE(ERD-550) | 2 | |
| B5 | 813 390096AA | IMP, ROLLER: DR-19-B1 PI19 | 2 | |
| B6 | 27308-203-001 | PLAIN WASHER | 2 | |
| B8 | 841 514013BB | MACHINE SCREW, TH+, M4*8 | 2 | |
| | 813 395000AA | IMP, SHAFT-LOCK: S45C PI5.0 | 1 | |
| | 841 213008BC | MACHINE, SCREW, FH+, M3X6: NO, FH, +, M3, L6, BL | 1 | |
| | 857 150008AG | MISCEL, RING, E, ID3, #3: ID3, OD7, T0.6, BLACK | 1 | |

C.ASSY-HOUSING

| | | | | |
|----|---------------|---|---|--|
| C1 | 2D903-701-051 | ASSY-SUB HOUSING | 1 | |
| | 813 390007AA | IMP, HOUSING: SBC-1 T1.0 DRAK BROWN | 1 | |
| | 813 390031AA | IMP, CHANNEL-LH: SBC-1 T1.6 DARK BROWN PI | 1 | |
| | 813 390032AA | IMP, CHANNEL-RH: SBC-1 T1.6 DARK BROWN PI | 1 | |
| | 813 390037AA | IMP, FRONT-PLATE: SBC-1 T1.0 DARK BROWN P | 1 | |
| | 813 390038AA | IMP, REAR-PLATE: SBC-1 T1.0 DARK BROWN PI | 1 | |
| | 813 390058AA | IMP, SUPPORT-CHANEL: SBC-1 T1.2 DARK BROW | 1 | |
| C2 | 813 390096AA | IMP, ROLLER: DR-19-B1 P119 | 2 | |

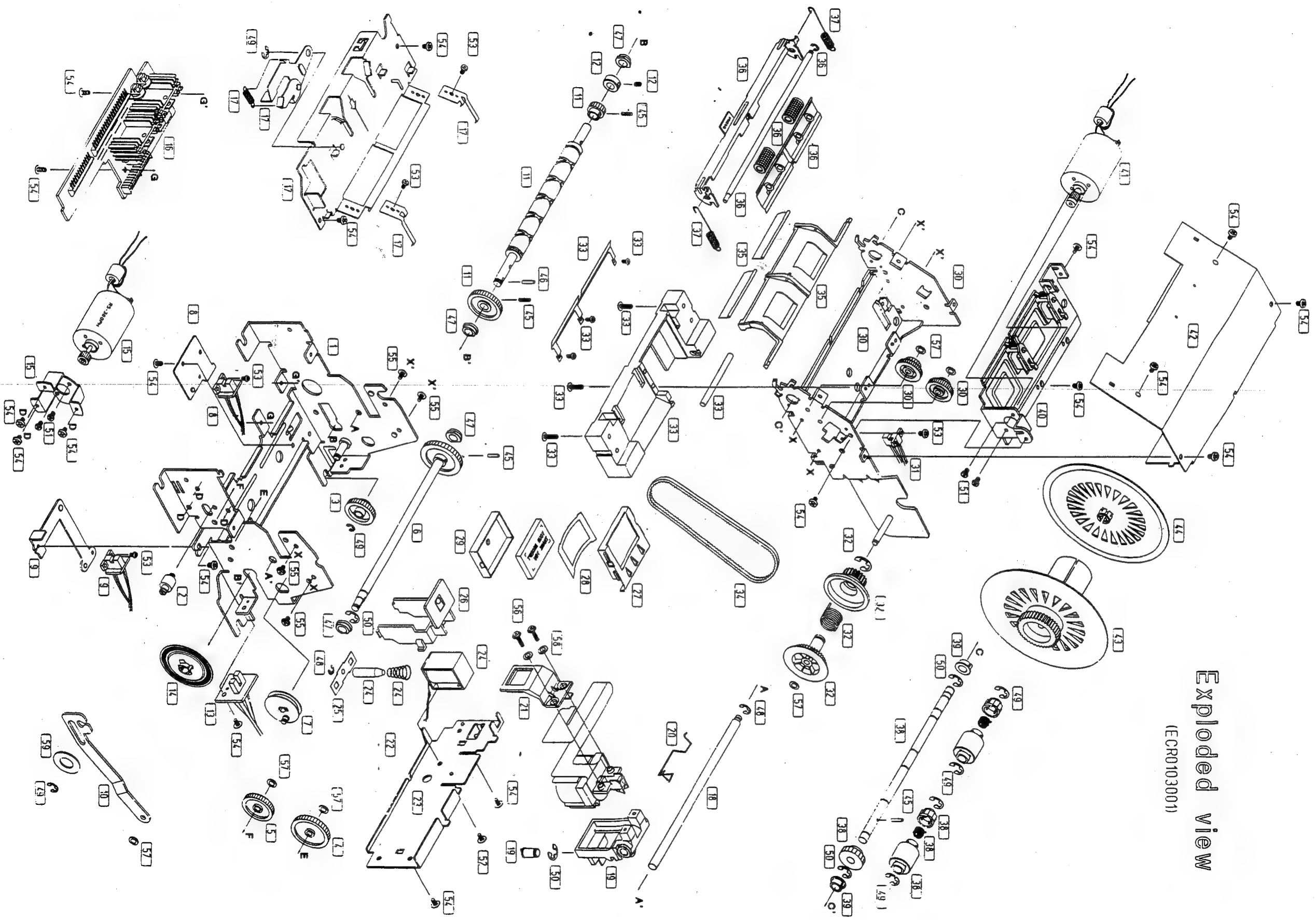
(DRAWER DISASSEMBLY DIAGRAM)

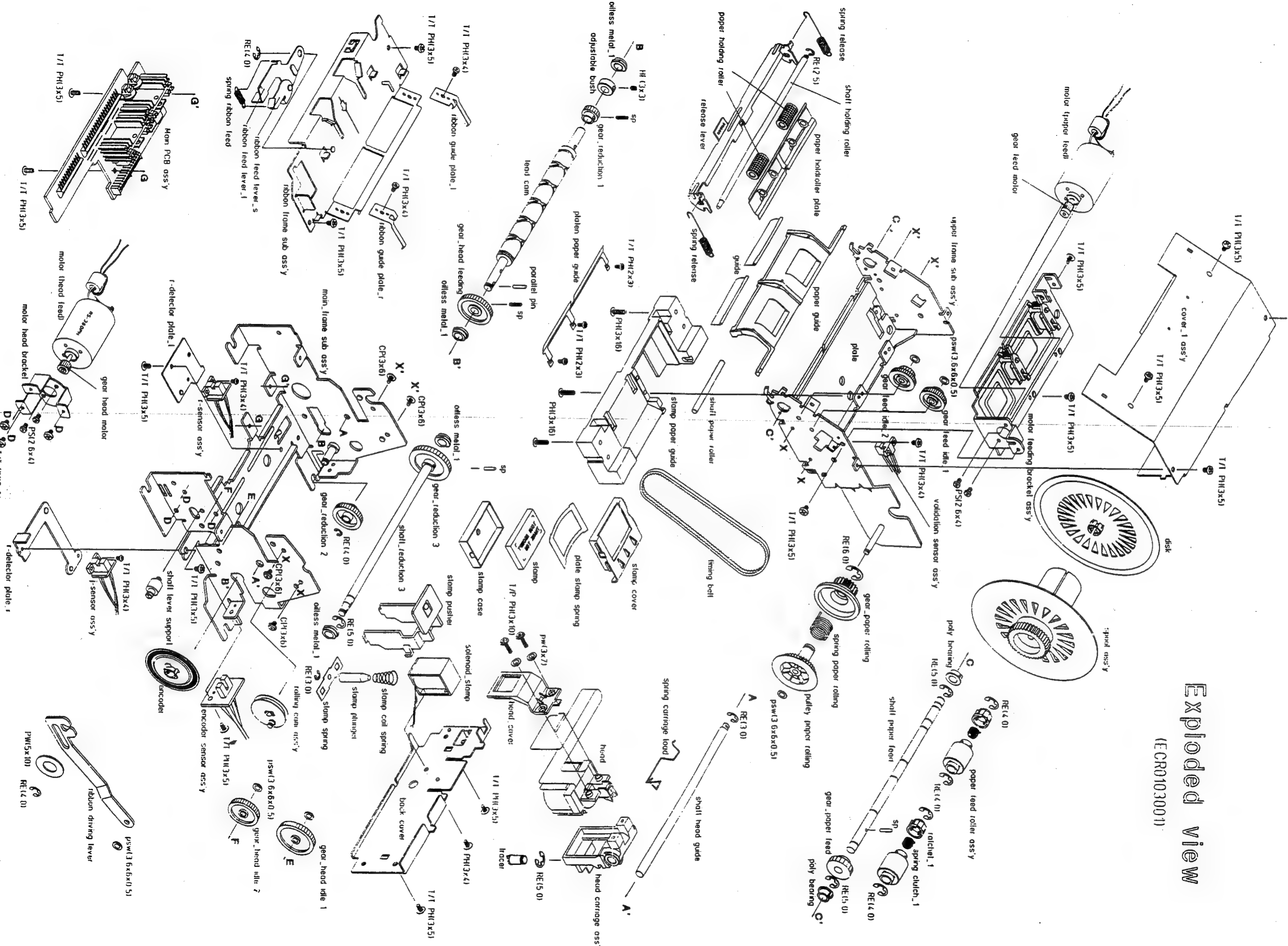


PRINTER ERP-300V

| LO.NO | SEC CODE | DESCRIPTION/SPECIFICATION | REMARK |
|-------|---------------------------|--|------------------|
| | 353 033106FBAD S09-15E | IMPACT DOT PRINTER : ERP-300V HEAD ASS'Y:69828-16001AA, A/S | HEAD 9 PIN ASS'Y |
| 1 | 996 139002GZ | MAIN FRAME CAULKING ASS'Y, ECR01-210, A/S | |
| 2 | 996 139002AG | SHAFT LEVER SUPPORT:18634-00060EA, A/S | |
| 3 | 996 139002AL | GEAR REDUCTION_2:18613-01050AB, A/S | |
| 4 | 996 139002AU | GEAR HEAD IDLE_2:18613-01020AB, A/S | |
| 5 | 996 139002AT | GEAR HEAD IDLE_1:18613-01010AB, A/S | |
| 6 | 996 139002HA | GEAR REDUCTION_3 ASS'Y, ECR01-220, A/S | |
| 7 | 996 139002HB | ROLLING CAM ASS'Y, ECR01-121, A/S | |
| 8 | 996 139002HC | R-RESET SENSOR ASS'Y, ECR01-440, A/S | |
| 9 | 996 139002HD | J-RESET SENSOR ASS'Y, ECR01-430, A/S | |
| 10 | 996 139002FJ | RIBBON DRIVING LEVER:18607-01000AA, A/S | |
| 11 | 996 139002HE | LEAD CAM ASS'Y, ECR01-230, A/S | |
| 12 | 996 139002HF | AD_BUSH ASS'Y, ECR01-450, A/S | |
| 13 | 996 139002HG | ENCODER SENSOR ASS'Y, ECR01-400, A/S | |
| 14 | 996 139002CF | ENCODER:18614-01000AB, A/S | |
| 15 | 996 139002HH | HEAD MOTOR ASS'Y, ECR01-340, A/S | |
| 16 | 996 139002HJ | MAIN PCB ASSEMBLY, ECR01-320, A/S | |
| 17 | 996 139002HK | RIBBON FRAME ASS'Y, ECR01-380, A/S | |
| 18 | 996 139002HL | SHAFT HEAD GUIDE, 18634-00030EA, A/S | |
| 19 | 996 139002HM | HEAD CARRIAGE ASS'Y, ECR02-370, A/S | |
| 20 | 996 139002BA | SPRING CARRIAGE LOAD:51298-09406XA, A/S | |
| 21 | 996 139002BH | HEAD COVER:18604-01020AB, A/S | |
| 22 | 996 139002HP | BACK COVER ASS'Y, ECR01-141, A/S | |
| 23 | 996 139002HQ | BACK COVER, 18604-01000AA, A/S | |
| 24 | 996 139002HR | SOLENOID STAMP ASS'Y, ECR02-450, A/S | |
| 25 | 996 139002EE | STAMP SPRING:18611-01010AA, A/S | |
| 26 | 996 139002HS | STAMP PUSHER, 18618-01000AB, A/S | |
| 27 | 996 139002FM | STAMP COVER:18604-01030AB, A/S | |
| 28 | 996 139002FN | PLATE STAMP SPRING:18611-01000AA, A/S | |
| 29 | 996 139002FP | STAMP CASE:18615-01000AB, A/S | |
| 30 | 996 139002HT | UPPER FRAME ASS'Y, ECR01-111, A/S | |
| 31 | 996 139002HU | VALIDATION SENSOR ASS'Y, ECR01-420, A/S | |
| 32 | 996 139002HV | PAPER ROLLING ASS'Y, ECR01-370, A/S | |
| 33 | 996 139002HW | STAMP PAPER GUIDE ASS'Y, ECR02-240, A/S | |
| 34 | 996 139002DY | TIMING BELT:51423-07122XA, A/S | |
| 35 | 996 139002HY | PAPER GUIDE ASS'Y, ECR01-191, A/S | |
| 36 | 996 139002HZ | RELEASE LEVER ASS'Y, ECR01-151, A/S | |
| 37 | 996 139002ER | SPRING RELEASE:51222-06053XA, A/S | |
| 38 | 996 139002JA | PAPER FEED SHAFT ASS'Y, ECR01-330, A/S | |
| 39 | 996 139002FT | POLY BEARING:51602-06000AA, A/S | |
| 40 | 996 139002JB | MOTOR FEEDING BRACKET ASS'Y, ECR01-300, A/S | |
| 41 | 996 139002JC | PAPER MOTOR ASS'Y, ECR01-350, A/S | |
| 42 | 996 139002JD | COVER_1 ASS'Y, ECR01-161, A/S | |
| 43 | 996 139002JE | SPOOL ASS'Y, ECR01-181, A/S | |
| 44 | 996 139002JF | DISK, 18628-01000AB, A/S | |
| 45 | 996 139002JG | SP(PI 2X10), 52062-01000QA, A/S | |
| 46 | 996 139002GQ | PARALLEL PIN (2 X 10):52015-01000XA, A/S | |
| 47 | 996 139002FR | OILESS METAL-1:51601-06000AA, A/S | |
| 48 | 996 139002GK | E-RING (RE 3.0) :51855-03006XA, A/S | |
| 49 | 996 139002GL | E-RING (RE 4.0) :51855-04006XA, A/S | |
| 50 | 996 139002GM | E-RING (RE 5.0) :51855-05006XA, A/S | |
| 51 | 996 139002JH | SCREW(PS 2.6X4), 50032-26041EA, A/S | |
| 52 | 996 139002FW | SCREW(PH 3X4):50032-30041EA, A/S | |
| 53 | 996 139002GD | SCREW(T/T PH 3X4):50232-30049EA, A/S | |
| 54 | 996 139002JJ | SCREW(T/T PH 3 X 5), 50232-30059EA, A/S | |
| 55 | 996 139002JK | SCREW(CP 3 X 6), 50032-30061EC, A/S | |
| 56 | 996 139002JL | SCREW(T/P PH 3X10), 50232-30104EA, A/S | |
| 57 | 996 139002GF | PSW(3.6 X6.0 X 0.5):51001-03605XA, A/S | |
| 58 | 996 139002GG | PW(3 X 7):51002-03006EA, A/S | |
| 59 | 996 139002GH | PW(5 X 10 X 1.0):51002-05010EB, A/S | |

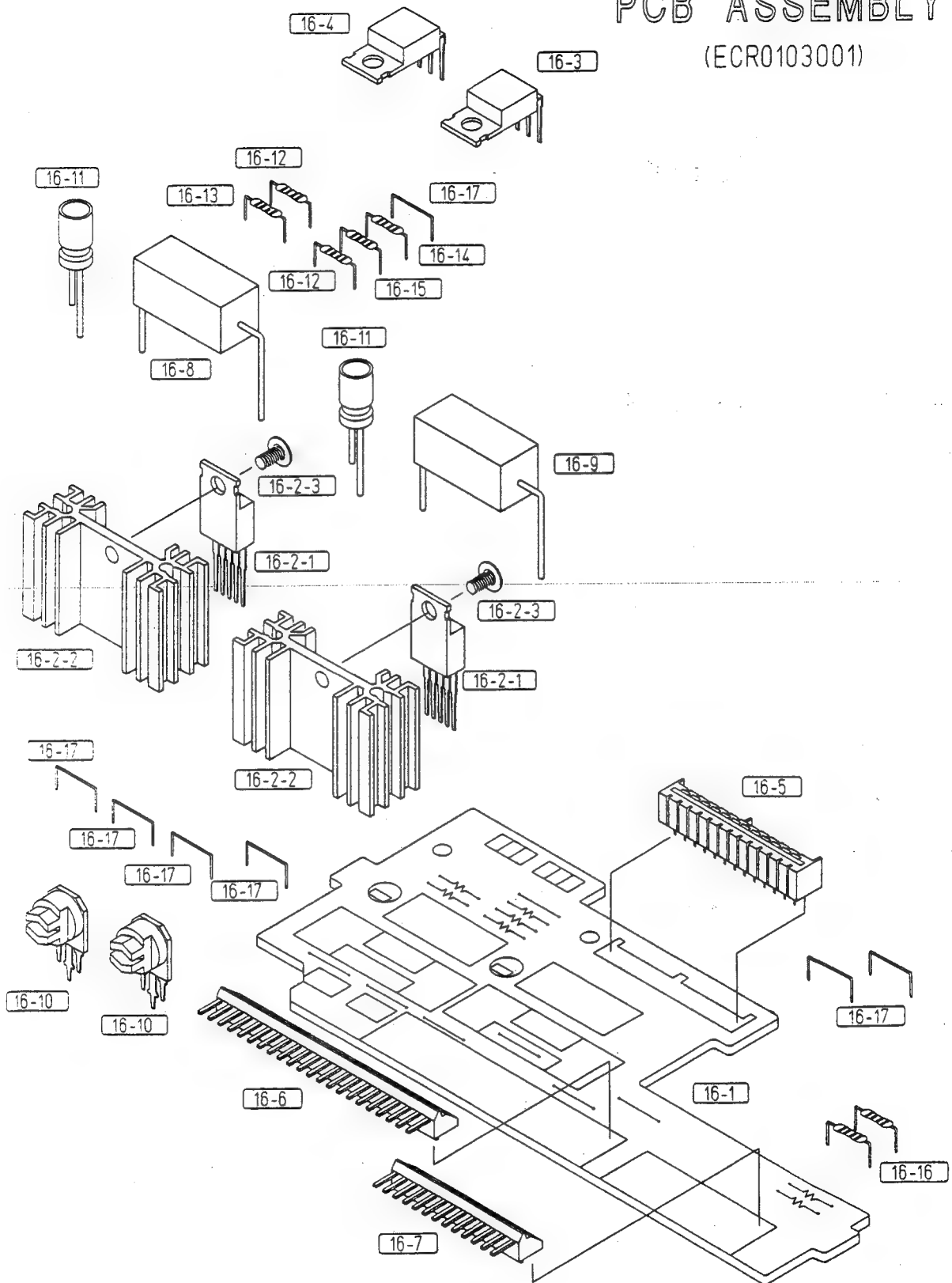
Exploded view
(ECR0103001)

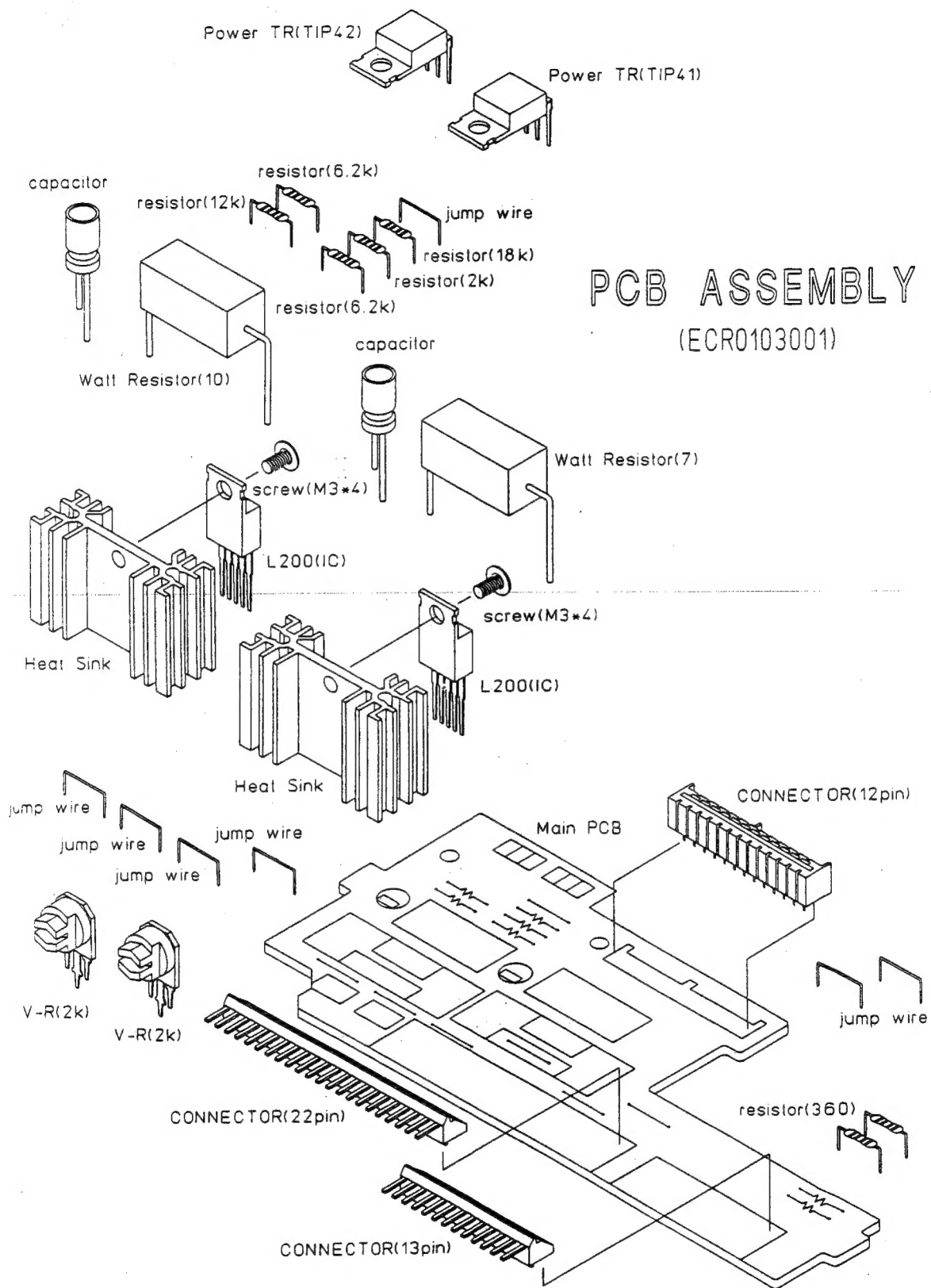




PCB ASSEMBLY

(ECR0103001)

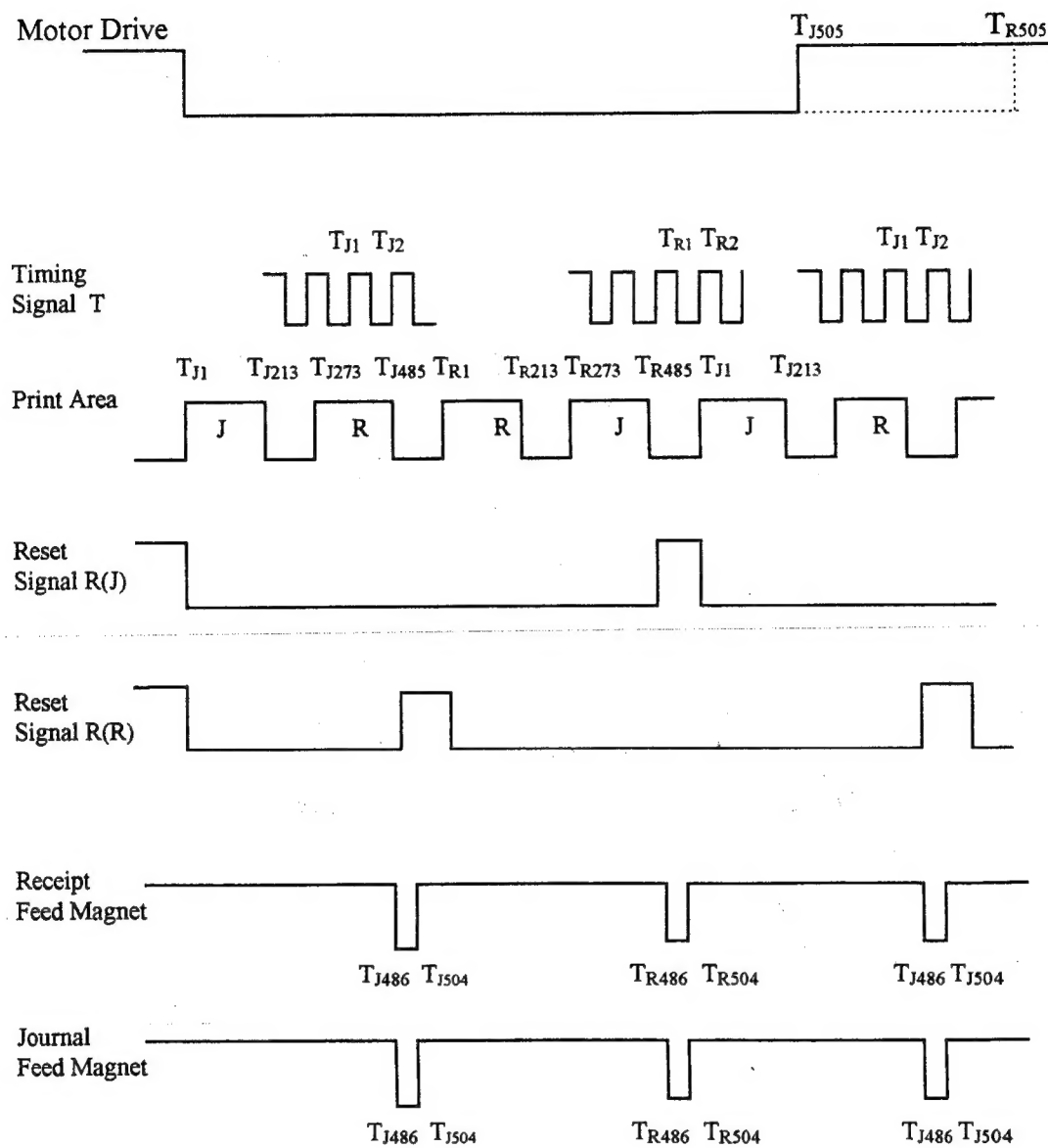




PCB ASSEMBLY

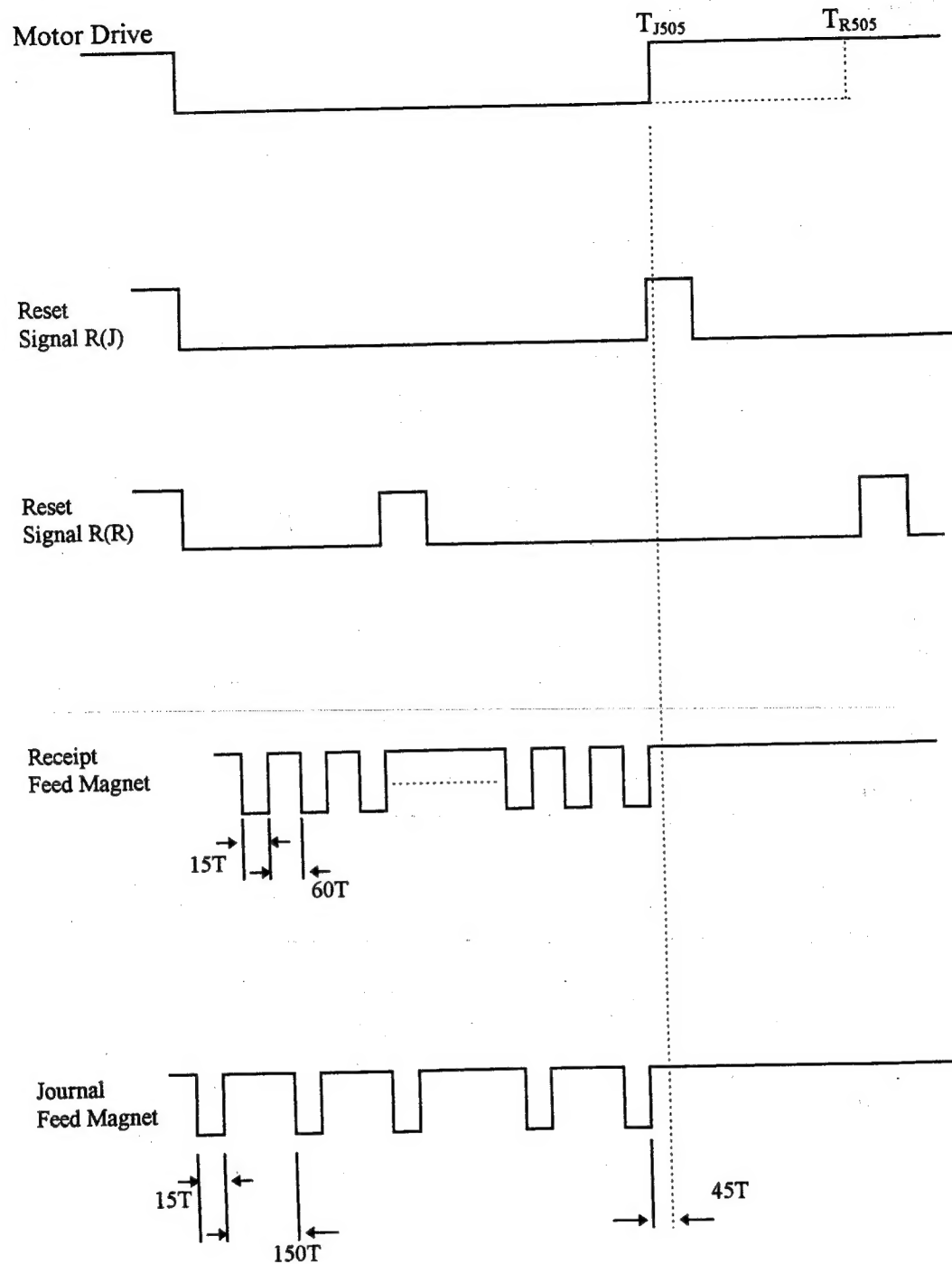
(ECR0103001)

9. Timing Chart printing and paper feed



1. Motor is turned off at T_{J505} or T_{R505} .
2. On validation print, printing action is turned on at T_{J1} - T_{J485} and T_{R1} - T_{R485} .
Motor is turned off at T_{R505} or T_{J505} .

Fast feeding



Receipt issuing

